Climate mainstreaming in the EU Budget: preparing for the next MFF

Final report

September 2017

Daniel Forster, Hetty Menadue, James Tweed (Ricardo Energy & Environment),
Martin Nesbit, Andrea Illes (IEEP).
Rob Williams, Jeroen van der Laan, Lisa Eichler (Trinomics)
Reviewed by Robert Tippmann, (Climatekos)

EUROPEAN COMMISSION

Directorate-General for Climate Action
Directorate A — International and Mainstreaming
Unit A.2 — Climate finance, mainstreaming, Montreal Protocol

Contact: Eero Saue

E-mail: Eero.Saue@*ec.europa.eu*

European Commission
B-1049 Brussels

Climate mainstreaming in the EU Budget: preparing for the next MFF

Final report

Europe Direct is a service to help you find answers to your questions about the European Union.

Freephone number (*)**:**

00 800 6 7 8 9 10 11

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Luxembourg: Publications Office of the European Union, 2017

ISBN 978-92-79-73510-3 doi:10.2834/218038 ML-04-17-844-EN-N

Table of contents

1 Introduction

1.1 Policy context

1.1.1 EU Energy and Climate commitments

The European Commission is looking at cost-efficient ways to make the European economy more climate-friendly and less energy consuming. Its low-carbon economy roadmap[1] suggests that by 2050, the EU should cut greenhouse gas emissions to 80% below 1990 levels. Milestones to achieve this are 20% emissions cuts by 2020[2], and 40% by 2030[3]. Alongside these mitigation targets, the EU adaptation strategy helps to ensure that adaptation considerations are addressed in all relevant EU policies.

The delivery of the EU's climate objectives will require significant investment. At the time that the Europe 2020 Strategy was adopted, it was estimated that by 2020 public and private investment of ~€125 billion per annum would be needed to carry out climate mitigation actions across all sectors (including agriculture, buildings, energy, industry, transport, and waste). Further investment is also necessary for climate adaptation actions; and climate resilience needs to be built in to all long-term investments.

1.1.2 The Multiannual financial framework (MFF)

The multiannual financial framework (MFF) provides a framework for financial programming at the EU level. It lays down the maximum annual amounts ('ceilings') which the EU may spend in different political fields ('headings') over a period of at least 5 years. It also allows the EU to carry out common policies over a period that is long enough to make them effective. This long term vision is important for potential beneficiaries of EU funds, co-financing authorities as well as national treasuries.

With a view to responding to the challenges and investment needs related to climate action, the European Commission is implementing a mainstreaming methodology during the current (2014-2020) MFF including by aiming to make at least 20% of EU expenditure climate related.[4] The 'reflection paper on the future of EU finances'[5] published by the European Commission in late June 2017 further emphasises this aim to streamline and simplify the EU budget system in order to facilitate more efficient spending.

1.2 Objectives of the study

The objectives of this study are to provide a review of how the current (2014-2020) MFF arrangements for climate mainstreaming, and for tracking climate-related expenditure and its achievements, have operated in practice; and to make recommendations for potential options for improving the current approach and processes.

1.2.1 Scope of the current report

To meet the above objectives a review has been performed the different approaches that have been taken to mainstream climate change issues into EU budget programmes and financial instruments, as well as the approaches to track climate expenditure (inputs) through budget programmes, the leverage of investment from financial instruments (outputs) as well as the overall effects of these investments on greenhouse gas emissions and climate adaption actions (results).

Separate reports have been prepared for each of the different elements of the review (mainstreaming, inputs, outputs, results), along with a further report assessing the investment needs associated with

[1] COM(2011) 112, A roadmap for moving to a competitive low carbon economy by 2050. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0112
[2] COM (2010) 639, Energy 2020. A strategy for competitive, sustainable and secure energy. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1409650806265&uri=CELEX:52010DC0639
[3] COM(2014) 15, A policy framework for climate and energy in the period from 2020 to 2030. Available at: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52014DC0015
[4] COM(2011) 500, A budget for Europe 2020. Available at http://eur-lex.europa.eu/resource.html?uri=cellar:d0e5c248-4e35-450f-8e30-3472afbc7a7e.0011.02/DOC_4&format=PDF
[5] COM(2017) 358, Reflection paper on the future of EU finances. Available at: https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

the EU's climate targets. This current report provides a synthesis of the methodology used, the key findings, and the overarching recommendations across the whole the project. More details of the work are in Annexes to this synthesis report:

- Annex 1: Investment needs to meet EU 2030 and 2050 climate and energy targets
- Annex 2: Analysis of existing approaches and processes of mainstreaming in EU instruments
- Annex 3: Input tracking
- Annex 4: Output/mobilised investment tracking
- Annex 5: Results tracking
- Annex 6: Transparency and reporting

2 Methodology

2.1 Investment needs to achieve 2030 and 2050 climate and energy targets

An estimate was made of the overall level of investment needed within the European Union (EU) to achieve the 2030 and 2050 climate and energy targets. The estimate was based on a literature review and our own (data) analysis. The analysis drew upon a number of previous and ongoing studies and collated estimates of EU investment needs across various sectors. This includes work carried out directly by our project team for DG Energy[6], the European Parliament[7], the European Environment Agency[8] and several EU Member State governments[9].

For each of the main studies we gathered data on the basic characteristics of the studies, and the associated estimates of the investment needs. The information on the characteristics of the studies was important to gauge the comparability of the different estimates. For example:

- The different estimated values for the total investment needs (with large methodological uncertainties) are influenced by different modelling mechanisms, framework parameters and conventions for cost-estimate. The results often have a different timeframe and geographical coverage;
- The future investment needs results are strongly influenced by the assumptions on energy demand and primary energy and GHG-allowances, prices, technological developments in energy transformation and end-user applications (e.g. learning rates). Distribution grid costs are often omitted which places doubt on the investment estimates of total grid costs.

An overview of the most relevant studies that considered, their scope, as well as the bandwidth of the investment needs estimates, is presented in Annex 1. The overview includes both mitigation and adaptation studies.

2.2 Climate mainstreaming

The analysis involved the study of climate mainstreaming in the EU budget at two levels. The first level, and the one on which there is most information available, concerns the conscious decisions made in relation to achieving the requirement that climate action objectives "will represent at least 20 % of EU spending in the period 2014-2020"[10]. The 20 % climate expenditure target in this sense is a key tool to support mainstreaming climate change objectives into the EU budget as a whole; but it is one element in the mainstreaming of climate in the EU budget, and not the only approach adopted. The second level therefore takes a broader perspective and includes actions taken under the various EU funds to integrate climate objectives into the relevant policy areas as well as the impact of the 20 % target on the integration of climate objectives into budget allocation decisions (see more in Annex 2).

Our analysis makes a clear distinction between climate mainstreaming (see Annex 2) and climate-related expenditure tracking (see Annex 3). As such, the analysis in Annex 2 focuses on the broad approach to mainstreaming in different programmes under the EU budget, rather than the detailed

[6] Rademaekers, K, et al (2017). Assessing the European clean energy finance landscape, with implications for improved macro-economic modelling. Deliverable 3 of the Study on the Macroeconomics of Energy and Climate Policies. European Commission, DG Energy. https://ec.europa.eu/energy/sites/ener/files/documents/macro_eu_clean_energy_finance_final.pdf
[7] European Parliament (2017). European Energy Industry Investments. Historic trends in actual spending for various periods as underlying Figure 8 on p. 35. http://www.europarl.europa.eu/RegData/etudes/STUD/2017/595356/IPOL_STU(2017)595356_EN.pdf
[8] Trinomics (2017) 'State-of-Play of European climate finance tracking'. Available at: http://trinomics.eu/wp-content/uploads/2017/07/State-of-play-of-European-climate-finance-tracking-published-6-July-2017.pdf
[9] Rademaekers et al (2016). Landscape of climate finance in Belgium. Federal Public Service (FPS) Health, Food Chain Safety and Environment, Belgium. http://www.klimaat.be/files/4914/6901/4152/Landscape_of_climate_finance_in_Belgium.pdf; and
Hainaut et al (2015). Landscape of climate finance in France 2011-2014. I4CE Institute for Climate Economics. http://www.i4ce.org/download/landscape-of-climate-finance-in-france-2015-edition-full-report/?wpdmdl=13071; and
Juergens et al (2012). The landscape of climate finance in Germany. Climate Policy Initiative. http://climatepolicyinitiative.org/wp-content/uploads/2012/11/Landscape-of-Climate-Finance-in-Germany-Full-Report.pdf
[10] European Council conclusions of 7-8 February 2013

analysis of inputs, results, and (for financial instruments) leverage that is the subject of other tasks of the study, and reported in the other annexes.

2.3 Transparency and reporting of inputs, output/mobilised investment and results

The methodology that was followed in the review of the transparency and reporting elements of the study is described below. A similar approach was followed for each of the different stages in climate tracking framework: inputs, outputs and results.

2.3.1 Selection of the budget programmes and financial instruments

An initial step in the analysis involved the selection of the specific budget programmes and financial instruments to be analysed in more detail.

While mainstreaming climate change considerations is important for all areas of the budget, in practice the potential for different areas of expenditure to deliver greenhouse gas (GHG) savings, or increase climate resilience, will vary considerably between the different budget programmes and financial instruments. It was therefore agreed that the review should focus on those areas of the budget that are expected to have the most significant climate-related impacts, since this is where the need for robust approaches to climate tracking are most important.

The budget programmes were selected on the basis of their relative contribution towards the total climate-related expenditure, as reported in the Staff Working Document accompanying the Mid-term Review of the MFF (SWD(2016)299)[11]. More specifically, all budget programmes with an expected climate-related expenditure of >1,000 million Euro, over the 2014-2020 programming period, were included in the in-depth analysis. These cover 99.6% of the total EU budget for 2014-2020. These budget programme were:

- European Earth Observation Programme (Copernicus)
- Horizon 2020 – The Framework Programme for Research and Innovation
- Connecting Europe Facility (CEF)
- European Regional Development Fund (ERDF)
- Cohesion Fund (CF)
- European Social Fund (ESF), estimate over the period
- European Agricultural Guarantee Fund (EAGF)
- European Agricultural Fund for Rural Development (EAFRD)
- European Maritime and Fisheries Fund (EMFF)
- Programme for the Environment and Climate Action (LIFE)
- Instrument for Pre-accession Assistance (IPA II)
- European Neighbourhood Instrument (ENI)
- Development Cooperation Instrument (DCI)

The financial instruments (FIs) were also selected based on relative volume of funding, although this was based on total EU contribution to the FIs in question due to a lack of data on climate-relevant funding. The selection was then refined based on a qualitative assessment of the climate relevance of the FIs (e.g. if the instrument has an explicit objective to address climate change, and/or are targeted on a sector that is clearly climate relevant). As a final step, the selection was refined to ensure that it captured a representative sample of the different instrument types / designs that the EU budget supports, as well as to include selected instruments with strong climate relevance but which did not meet the investment volume threshold. The selected FIs were:

- Research and Innovation
  - Horizon 2020 Loans service
  - InnovFin SME guarantee
  - InnovFin SME venture capital

[11] Commission Staff Working Document *Accompanying the document* Communication from the Commission to the European Parliament and the Council – Mid-term review/ revision of the multiannual financial framework 2014-2020. An EU budget focussed on results. SWD(2016)299. Brussels, 14.9.2016.

- Infrastructure, climate, environment and energy efficiency
  - Connecting Europe Facility (CEF) - Debt instrument
  - CEF - Equity instrument
  - Private Finance for Energy Efficiency Instruments (PF4EE)
  - Natural capital financing facility (NCFF)
  - Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) - The Loan Guarantee Facility (LGF)
  - Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) - The Equity Facility for Growth (EFG)
- Enlargement Countries
  - Guarantee facility - Western Balkans Enterprise Development and Innovation facility (EDIF GFI)
  - Guarantee facility II - Western Balkans Enterprise Development and Innovation facility (EDIF GFI II)
  - European Fund for Southeast Europe (EFSE)
  - Green for Growth Fund (GGF)
  - Enterprise Expansion Fund (ENEF) (under EDIF)
  - Enterprise Innovation Fund (ENIF) under EDIF
  - Global Energy Efficiency and Renewable Energy Funds (GEEREF)
- Neighbourhood Countries
  - Facility for Euro Mediterranean Investment Partnership (FEMIP)
- Development Cooperation Instrument (DCI)
  - Investment Facility for Central Asia (IFCA) and Asian Investment Facility (AIF)
  - Latin American Investment Facility (LAIF) (2014-20)
- Financial Instruments under the European Structural and Investment Funds (ESIF) (2014- 20)
  - European Regional Development Fund (ERDF) and Cohesion fund (CF)
  - European Social Fund (ESF)
  - European Agricultural Fund for Rural Development (EAFRD)
  - European Maritime and Fisheries Fund (EMFF)
- Others (2014-20)
  - European Fund for Strategic Investment (EFSI)
  - European Development Fund (EDF) Blending Framework: Africa Investment Facility (AfIF); Caribbean Investment Facility (CIF); Investment Facility for the Pacific (IFP)

2.3.2 Data collection

The data collection process aimed to capture the following information:

- Specific monitoring and reporting requirements and procedures for climate-relevant elements of the EU budget - This includes requirements in relation to both positive and negative (in climate terms) areas of the budget.
- Performance indicators and other metrics used in the monitoring and reporting of climate-relevant elements of the budget
- Methodological frameworks used in the assessment of performance of climate-relevant elements of the budget
- Guidance for the development and implementation of indicators and monitoring frameworks
- Results data on climate-relevant elements of the budget

2.3.3 Data analysis

The information gathered for each of the individual budget programmes and FIs was synthesised and further analysed in order to:

- Assess the relevance of the current indicators and approaches;
- Identify gaps, overlaps and discrepancies with the current approaches;
- Gather results data, and as far as possible quantify the GHG impacts of the current MFF.

The various indicators, methodological frameworks and guidance documents were mapped against each of the budget programmes and FIs, and then further compared with each other. This was used

to identify potential gaps and inconsistency in the current approaches to tracking, but also particular strengths (e.g. best practice), and areas requiring further strengthening.

A broader review was also performed of selected methodologies, tools and guidance used outside the EU, in order to identify best practice from elsewhere.

2.3.4 Development of options for improvements

Drawing on the analysis of the tracking framework for the current MFF a series of options were then developed for strengthening the monitoring and reporting framework.

Options were identified for the main areas for improvement identified in the earlier analysis. These considered both content issues for the monitoring and reporting (e.g. what needs to be reported) but also process issues (e.g. how to report the information).

The performance of each of the options was evaluated against a consistent set of criteria. These were:

- Effectiveness – in addressing the underlying problem areas
- Efficiency – including the cost/effort involved
- Feasibility – of implementation in practice (in terms of technical feasibility and political acceptance)
- Coherence – between the different elements of the budget

Following the evaluation of the individual sub-options, the most promising options were then grouped together into an overall package of recommended improvements.

2.3.5 Simulation of the GHG profile

For certain budget programmes and FIs quantitative information has been reported for the specific performance indicators. This includes information for the climate-relevant indicators. This information was compiled across each of the programmes and FIs, to provide a first estimate of the total GHG impacts of the EU budget.

3 Investment needs to achieve 2030 and 2050 climate and energy targets – conclusions, options and recommendations

This study considered:

- Estimated mitigation investment needs in Europe
- Estimated investment needs for climate adaptation in Europe
- Potential contribution of the EU budget towards the overall investment needs
- Options and recommendations regarding the role of the EU budget in meeting the needs

Details of the study are in Annex 1. Conclusions, options and recommendations are summarised here.

3.1 Conclusions: estimated mitigation investment needs in Europe

The EU remains committed to cut GHG emissions by at least 40% by 2030 and to achieve 80-95% emission reductions by 2050. Delivery of these objectives will require significant investment in mitigation measures. Understanding the estimated level of the mitigation investment needs in Europe provides the broader context within which to view the contributions of the EU's budget.

The estimated investment needs have been assessed in Annex 1 and represent overall total estimated mitigation investment needs.

Estimated overall investment needs are often confused with what can be called the 'remaining financing gap', or incremental costs. The remaining financing gap, however, is in essence the difference between the 'business-as-usual' scenario (assuming all currently adopted policies continue, but no additional efforts are taken) and the scenario that best resembles achievement of the set policy targets. This difference between the two pathways is the amount of finance that is needed 'on top of / in addition to' the level of climate action finance that would 'happen anyway' under the business-as-usual scenario.

Analysis in Annex 1 considers(a) the overall estimated investment needs up to 2030 based on a business-as-usual pathway (REF2016 scenario), (b) the total investment needs based on achieving the EU's energy and climate targets (EUCO30 scenario), and (c) the remaining mitigation financing gap in Europe (i.e. the difference between EUCO30 and REF2016 scenario results). It should be noted here that the REF2016 scenario is assumed to include all the planned and future anticipated public and private investments that are assumed to occur based on historic spending levels. As such, the difference between the REF2016 and EUCO30 scenarios represents the remaining financing gap for European domestic climate finance. This analysis suggests that the cumulative investment needs from 2021 to 2030 under BAU conditions are 9 448 bn EUR'15, total investment needs to achieve the EU's 2030 climate and energy targets are 11 230 bn EUR'15, therefore leaving a remaining finance gap for European domestic mitigation finance of 1 782 bn EUR'15. That is 178 bn annually between 2021-2030, and is distributed across various sectors of the economy, with highest remaining financing gap for European domestic climate finance. (see Table 2-6 in Annex 1)

3.2 Conclusions: estimated adaptation investment needs

Contrary to the mitigation challenge, there are currently no investment needs estimations on the adaptation challenge that best reflect the total, comprehensive (across all adaptation-relevant action areas and sectors) investment needs for Europe. The estimations that do exist cover rather different scopes and underlying assumptions. As a very rough indication, the following table summarises the estimated adaptation investment needs that best capture the various adaptation areas, European scope and relevant timeframe. The large range between the two studies can partially be attributed to the difference in the amount of adaptation-relevant sectors covered.

Table 3-1: Attempting to define an order of magnitude range for European adaptation investment needs

Source	Geography	Coverage	Unit	Estimated annual investment needs range
BASE study (2016)	~EU-28[12]	Floods, agriculture and health	Bn EUR'15	35-62
De Bruin et al. (2009)	Western Europe only	Agriculture, other vulnerable markets, coastal, health, non-market time use, catastrophic events and settlements (no split)		158-518

[Source: based on estimations from De Bruin (2009) and BASE study (2016)]
[Figures differ from original unit values as provided in Annex 1, Table 2-8, here converted to 2015 constant Euros using an online Inflation Calculator (Westegg.com) and OECD exchange rates: https://data.oecd.org/conversion/exchange-rates.htm]

Since these sources suggest a very broad range of anywhere between 35bn EUR'15 up to more than 500bn EUR'15 and because there is no availability of reference scenarios as is the case for the mitigation field, it is currently impossible to establish a remaining financing gap for adaptation. However, what is clear from the analysis is that despite the many knowledge gaps and uncertainties involved, there is an urgent need for continued and up-scaled investment in climate adaptation across Europe, as well as the need for better risk models to make the economic case for adaptation.

3.3 Conclusions: Potential contribution of the EU budget towards the overall investment levels

As with the analysis carried out to estimate investment needs, it is more logical to disaggregate the assessment of the contribution of the EU Budget towards the overall investment needs between contributions to the climate-related challenges of mitigation and adaptation. This disaggregation reflects differences in identified investment needs, typical sources of finance and relevant climate action sectors. Additionally, more quantitative data is available regarding mitigation finance, whereas many of the issues related to adaptation finance need to be discussed in a qualitative way.

The only major issue with this type of approach is the fact that EU Budget data is currently not disaggregated in this manner. None of the reporting of climate-relevancy across programmes requires data on this split. Therefore, to still enable a meaningful discussion and analysis, we have suggested a disaggregation between mitigation and adaptation funding based on expert judgment. It should be noted however, that we have made an expert judgement of the proportion of climate-marked expenditure which is relevant to climate adaptation or to climate mitigation. These should not be taken as estimates of the total adaptation-relevant expenditure and the total mitigation-relevant expenditure respectively, since funds or projects may be able to contribute to both adaptation and mitigation, i.e. have co-benefits.

Initial calculations have been made on the EU Budget contribution to both current and future annual mitigation investment needs. These suggest the contribution from the EU Budget could support total mitigation finance needs by covering approximately 5-7% of the total required investment levels. This

[12] The 2016 BASE project uses a different geographical scope for each adaptation category, which mostly reflects a coverage of the EU28.

emphasises that most of the finance needed would actually have to stem from other public and private sources.

Given the large range in estimated adaptation investment needs and the difficulty of arriving at an overarching figure on a European level encompassing all (or most) areas of adaptation action, it is currently not possible to quantitatively express the EU Budget's contribution to adaptation finance.

3.4 Options and Recommendations regarding the role of the EU Budget

While the goal of this part of the analysis (Annex 1) was primarily to analyse the existing investment needs, some recommendations were also developed in relation to the role of the EU Budget. These arose, in part, from consultation with stakeholders as part of a workshop where the preliminary results of the study were presented.

3.4.1 Using the potential of the National Energy and Climate Plans for optimising EU Budget mainstreaming and prioritisation

The National Energy and Climate Plans (NECPs) envisioned in the Regulation on the Governance of the Energy Union could have an important role in improving transparency in relation to investment needs. Specifically, the plans could serve as an instrument for Member States to outline their ambitions regarding mitigation and adaptation activities and the corresponding investments required to meet those ambitions. The systematic development of these NECPs would therefore provide better information at EU level and would eventually allow for a more efficient allocation of EU funds to Member States who pledge higher climate and clean energy targets. If such investment identified under the NECPs also included a risk assessment, it could further help to identify both public and private investment needs, provide guidance for specific programmes and help deploy the MFF means where they are most needed, thus serving as an efficient horizontal mechanism of climate mainstreaming.

In addition, such forward-looking capital-raising plans on MS levels directly related to each MS's climate and energy objectives could also strengthen investor confidence and increase investment attractiveness for private finance sources.

Despite this high potential of the NECPs to support and optimise climate mainstreaming and prioritisation of the EU Budget, the NECPs delayed adoption will likely raise difficulties in linking them to the discussion on the MFF post-2020 in the context of climate and energy investment needs.

3.4.2 Supporting sectors and local authorities in their investment decisions

The sectors identified as having the greatest additional investment potential to attain 2030 and 2050 targets are building and transport sectors. Local actors are essential players in the investment decisions for both sectors, but their respective needs in terms of applying for funding and implementing projects are currently not explicitly addressed. Given the lack of available, reliable data, local actors sometimes find themselves in the dark when it comes to planning investments. In this sense, establishing a strong role for the EU as a data/information aggregator/observatory could provide both the right authority for gathering data on risks, challenges and investment needs to address them and the right counselling for local and regional actors at the time of project development and implementation. This option has also been highlighted by one of the involved stakeholders.[13]

3.4.3 The important role of the EU Budget to continue leveraging co-finance

As shown in the analysis, the EU Budget accounts for only a small share of the overall investment needed to achieve climate and energy targets in Europe. Therefore, it is all the more important that the EU Budget is used to also leverage in co-finance from the private sector and other public institutions. When looking at infrastructure investments in the EU, for example, EU funding often enables sustainable infrastructure projects that would not happen without EU budgetary support.[14] As

[13] E3G (2017), Climate Action and the EU Budget: Priorities for the Next MFF. Available at: https://www.e3g.org/docs/2017_PDF_E3G_Key_issues_for_post_2020_MFF.pdf

[14] COM(2017) 358, Reflection paper on the future of EU finances. Available at: https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

such, the rules applying to EU co-financing can have a significant impact on the types and parameters of investments that take place in MS. Therefore, the EU Budget's role in co-financing for both mitigation and adaptation should continue to be emphasised whenever possible.

3.4.4 A careful consideration needs to be given to the timing and changing needs of the EU Budget's value added

As has been emphasised by various stakeholders during their engagement, the EU's supporting role could have different priorities in terms of what types of activities to support throughout the energy transition process timeline. For example, gas infrastructure and other similar elements might be a necessary component of the shorter term 'light green' transition which could be justified in line with 2030 targets. Yet, depending on the expended life-cycle of the assets, these investments may not be justified at a later stage of the transition, when EU Budget would likely add most value by supporting the 'dark green' type investments compatible with 2050 policy objectives.

4 Mainstreaming in EU programmes – conclusions, options and recommendations

The study reviewed the current climate mainstreaming approaches both at general level and in the selected budget programmes of the EU MFF. Details of the review are in Annex 2. Conclusions, options and recommendations are summarised here.

4.1 Conclusions

The headline conclusions from the review are:

- Overall, climate mainstreaming takes place at three stages within the EU MFF cycle: (i) across the whole EU budget (via a set of horizontal mechanisms), (ii) at the level of the policy priorities of the specific funds, and (iii) at the level of programme implementation.
- There are a wide set of tools that support horizontal mainstreaming. These include: (i) the 20 % climate mainstreaming target, (ii) the climate expenditure tracking methodology, (iii) the Common Provisions Regulation and its rules for the five ESI Funds, (iv) the requirements to climate-proof major project supported by the ERDF and the CF, (v) guidance provided by the Commissions on climate mainstreaming, and (vi) green public procurement.
- With the introduction of the 20 % high-level target for climate mainstreaming a two-fold commitment was made: first that climate change should be mainstreamed into all EU programmes and second that EU expenditure on climate objectives should amount to at least 20 % of the total EU budget.
- There was an absence of a coordinating mechanism on climate mainstreaming at the stage of the development of proposals within the Commission which suggests that the approach in the current MFF is based largely on an expected response to the overarching political commitment of the European Council and Parliament, with relatively limited mechanisms for addressing a shortfall should one emerge in practice.
- Nevertheless, the target seems to have acted as a driving force at the high-level in better integrating climate change considerations into the EU programmes, and in particular played a role for those funds which are under shared management. At the same time, the target's impact on expenditure decisions is difficult to identify as its translation into legislation also depended on a wide set of actors within the EU policymaking sphere.
- As the target does not differentiate between climate change mitigation and adaptation actions there is a limited potential to enforce the integration of mitigation and adaptation objectives with an equal emphasis which can make the mainstreaming process less tangible.
- The current mainstreaming target should be reached by 2020. Nevertheless, in the post-2020 MFF it will be important to reflect on the EU's long-term climate objectives– the 2030 and 2050 climate targets – and to ensure that these are also aligned with the aims of the Paris Agreement.
- The Common Provisions Regulation includes a wide set of requirements which have the potential to support climate mainstreaming objectives. These include: (i) the requirements of Article 8 on sustainable development, (ii) the need to develop Partnership Agreements, (iii) the establishment of thematic objectives, (iv) the introduction of climate-related ex ante conditionalities, (v) ex ante assessments and Strategic Environmental Assessments, and (vi) newly established common output indicators.
- Major projects supported by the ERDF and CF are subject to a cost-benefit analysis, which considers a carbon footprint assessment and the use of carbon shadow prices, and the preparation of vulnerability and risk assessments. These tools can greatly support climate mainstreaming. The more extensive use of climate risk assessments has the potential to improve adaptation actions on the ground, which are in general lagging behind mitigation actions within the EU budget and in particular in the ESI Funds.
- The full potential of green public procurement has not been reached yet within the EU Member States, partly due to the relative novelty of the revision of the EU public procurement rules and as such due to the lack of administrative capacity in this field.

- In the case of some EU funds (e.g. the Horizon 2020 and the Development and Cooperation Instrument) there has been a more active process of seeking out areas of climate focus and prioritising programmes and projects than in other areas. In contrast, in others (notably in the CEF and COSME) there does not appear to be a significant effort to identify climate priorities; rather, the programmes allow for expenditure on a specified range of types of project delivering the objectives of the programmes, and climate-relevant projects are among those which then access those funds.
- In some areas of the budget, the identification of specific climate objectives, and tracking of the 20 % commitment, may paradoxically limit the commitment to climate mainstreaming in other areas of the relevant programme – as the climate objective is regarded as being met by the specific climate spending commitments.
- In order to have a meaningful impact of climate mainstreaming in the EU budget, there must be tangible links to relevant policies, such as the Europe 2020 Strategy and its climate-relevant targets, as well as national climate policies. This is an area where progress seems to be limited and thus there is room for improvement.
- As EU funds contributing to the climate mainstreaming target have the potential to invest in sectors which can have negative impacts on climate objectives there is a need to identify and manage these impacts.
- It seems that the Commission has found it easier to ensure follow-through on the headline commitment and legal requirements to climate mainstreaming for programmes under shared management compared to those funds which are centrally managed.
- There is a broad range of approaches to the detail specified in climate mainstreaming methodologies. One mechanism adopted in a number of programmes has been the identification of minimum levels of spend on climate objectives.
- The extent to which climate mainstreaming has increased climate focus within the current programming period in comparison to the 2007-2013 period greatly differs between the various funds. For instance, while climate change objectives have been much more explicitly mainstreamed into Cohesion Policy funds compared to the 2007-2013 programming period the mainstreaming of climate objectives in the Rural Development Programmes in practice does not seem to have increased significantly in the 2014-2020 period compared to the 2007-2013 period.
- In addition to the EU funds that have been examined within this study, there are also other budget areas (e.g. humanitarian aid) that have the potential to support climate objectives.

4.2 Options

As described above, there are a number of different ways in which climate considerations have been mainstreamed across the budget programmes within the current MFF. There are also areas where climate mainstreaming could be strengthened. A series of potential options for improving the EU approach to climate mainstreaming were developed. These are set out in the table below. A more detailed version of this table, considering also expected impacts of the options and also feasibility, implementation and risks is in Annex 2.

Table 4-1: Overview of problems and potential options

Problem	Option for change
Horizontal mechanisms	
Lack of a process to ensure that the 20% mainstreaming target is met; or that it is met with the most effective contribution to meeting climate objectives	Commission-wide process to identify priorities for climate expenditure, based on an analysis of which areas of the budget are capable of contributing most effectively to delivery of mitigation and adaptation targets, while also delivering on existing programme priorities.
The current climate mainstreaming target does not set separate targets for climate mitigation and adaptation actions, which is also reflected in the	Establishing separate mitigation and adaptation mainstreaming targets for the post-2020 MFF.

Problem	Option for change
current climate-expenditure tracking methodology.	
The current mainstreaming target focuses on the 2020 time horizon, and does not reflect the EU added value of a focus on investments needed to unlock mitigation needed for longer-term climate objectives.	Introduction of indicative climate mainstreaming targets which reflect on the EU's long-term climate objectives– the 2030 and 2050 climate targets – the Paris Agreement.
Risk that the attention paid to tracking of the 20% commitment may limit the focus on climate mainstreaming in other areas of each relevant programme.	Introduction of specific reporting requirements on broader mainstreaming in the legal basis of relevant programmes
Potential negative impacts of EU investment on climate objectives is not mitigated consistently	Introduction of sector investment guidelines and standards for the post-2020 EU budget, which establish rules and identify those areas where EU funding should not be provided.
Climate-relevant ex ante conditionalities do not identify all potential climate-relevant requirements	Extended use of climate mitigation and adaptation relevant ex ante conditionalities
Climate component of CBA and vulnerability and risk assessment is only applied in Cohesion Policy	Develop a set of good practice principles for the more extensive use of CBA and vulnerability and risk assessment across all funds for the post-2020 programming period.
Co-financing rates (under ESIF) currently do not integrate climate considerations	Differentiation of co-financing rates with the aim to incentivise projects which go beyond the minimum requirements on climate objectives
Inconsistent use of opportunities presented by Green Public Procurement	Greater support to capacity building in Member States; and use of the ex ante conditionalities to encourage greater use of GPP.
Lack of a widespread understanding among policymakers of potential for mainstreaming climate in programmes or projects	Better use of good practice examples both in terms of process (for example, effective guidance on mainstreaming used by DG DEVCO) and in terms of selection of projects and investments (for example, explicit weighting of climate impacts).
Programme priorities	
Limited link between EU spending priorities and EU and MS climate policies	Establish a closer link between climate -related spending in the EU budget and the future National Energy and Climate Plans (NECPs) under the currently negotiated Regulation on the Governance of the Energy Union.
Limited link between EU spending priorities and EU and MS climate policies	Establish a stronger link between allocations for mitigation actions and their contributions to the overall delivery of EU and MS climate objectives.
Limited link between EU spending priorities and EU and MS climate policies	Establish a requirement to link adaptation allocations to National Adaptation Strategies.

Problem	Option for change
Difficulties in ensuring effective climate mainstreaming in some programme areas	Earmarking of climate resources, or minimum spend requirements, should be considered more widely across programmes, on a case by case basis, and included in legislative proposals where appropriate
Centrally managed funds have less detailed processes for integration of climate mainstreaming, leading to a lack of focus in areas of expenditure which are not labelled as climate relevant	Processes for centrally-managed funds which replicate some of the detailed programming rules for shared management programmes, or mirrors its benefits in terms of a broad consideration of climate impacts; for example, reporting requirements, or stakeholder dialogue on climate impacts.
Programme implementation	
Climate mainstreaming is not always linked to intended results	Greater clarity on what results climate-related expenditure is expected to deliver, and a process (see Annex 5) for monitoring delivery of those results.
Some expenditure areas make little use of guidance to encourage better integration of climate objectives in implementation decisions.	Best practice in the use of guidance (and in particular in the practical impacts on guidance) should be identified and promulgated; where implementation decisions can increase the effectiveness of delivery of climate objectives, clear guidance should be provided.

4.3 Recommendations

Following the analysis of each of the individual options, the following options are recommended for further consideration by the Commission. These are grouped into two categories, the first are those which are relatively simple measures which can be implemented in the short-term. While recognising that the second group of options are more ambitious and in some cases can put increased administrative burden either on the Commission or the Member States we recommend that the Commission invest time into consider those as well, in particular in the longer-term, as they have the potential to bring EU added value to the mainstreaming process. The two sets of actions should be reviewed in view of the expected impacts and potential feasibility of the options as identified and explained in Annex 2.

In the short-term:

- For the improvement of the overall climate mainstreaming process for the post-2020 MFF we suggest that the Commission considers the following two options:
    - The Commission should carry out an analysis of all EU programmes and identify those which are the most capable of delivering climate objectives. For this process, we suggest the use of a traffic-light system, reflecting on the total budget of the programmes, the climate contributions, and their potential to deliver climate outputs in the short and the long-term. This analysis would lead to a Commission-wide process to identify priorities for climate expenditure in the post-2020 MFF and has the potential to significantly increase the coherence of climate mainstreaming and to actively encourage the integration of climate objectives into EU funds.
    - In order not to limit climate mainstreaming to direct climate allocations but to also encourage broader mainstreaming we suggest that specific reporting requirements should be introduced in the legal basis of relevant programmes on more general mainstreaming of climate into other investment areas. For the ESI Funds – similarly to the current framework - the potential for broader mainstreaming could be outlined in the Partnership Agreements, while detailed programme documentation could identify more specific contributions.

- Building on the suggestion of the Commission's reflection paper on the future of EU finances[15] we suggest introducing a "single rule book" for similar types of investments which could include a set of tools to support climate mainstreaming in a horizontal way. Building on the wide range of tools available for the ESI Funds we suggest introducing the following options to all EU investments:
    - Introduction of sector investment guidelines and standards for the post-2020 EU budget, which establish rules and identify those areas where EU funding should not be provided.
    - Establishment of a narrow set of key climate-relevant ex ante conditionalities for broader use within the post-2020 MFF. These conditionalities should be made relevant for the improved use of green public procurement as well.
    - The more extensive use of climate considerations in CBA for EU investment decisions should be considered together with vulnerability and risk assessments (also see suggestion below on linking these to National Adaptation Strategies in the long-term).
    - While the introduction of differentiated co-financing rates to incentivise ambitious climate allocations have the potential to improve climate mainstreaming across the whole budget a careful attention needs to be paid on establishing the right level of rates given that high EU co-financing levels can hinder the efficiency of spending.

In the long-term:

- The establishment of minimum spending requirements on climate objectives or earmarking of climate resources should be considered more extensively in the future MFF funding programmes on a case-by-case basis and should be include in the relevant fund-specific regulations, bearing in mind not to exceedingly constrain flexibility within the programmes.
- Drawing a closer link between EU climate allocations and EU and MS climate policies. Within the table above we have identified three options to do this:
    - Creating a link to the National Energy and Climate Plans (NECPs) under the currently negotiated Regulation on the Governance of the Energy Union.
    - Establishing a stronger link between allocations for mitigation actions and their contributions to the overall delivery of EU and MS climate objectives. In the case of ESIF, these could be linked to the national GHG emission reduction targets.
    - Greater use of vulnerability and risk assessments and in particular creating a closer link between National Adaptation Strategies and EU allocations to adaptation objectives.
- Consider the establishment of separate climate mitigation and adaptation mainstreaming targets in order to ensure that attention is paid to both objectives. As a first step towards this long-term goal, the Commission could identify those EU funds which would benefit of having separate mitigation and adaptation targets (e.g. if a fund is found to focus largely on mitigation actions and does not exploit its potential in adaptation separate targets could reduce these imbalances).
- Finally, in order to ensure the path towards the long-term decarbonisation of EU spending the future MFF's climate mainstreaming target should be viewed in the context of various longer-term timeframes in order to reflect on the EU's 2030 and 2050 objectives, as well as the Paris agreement.

Finally, while this study has focused on the climate mainstreaming approaches used within the EU programmes we recognise the need to mainstream climate objectives into domestic public budgets within the EU Member States as well, in particular in view of their role in achieving the investment needs required to reach the EU climate policy objectives (see more in Annex 1). **The EU's approach to climate mainstreaming, and in particular its horizontal tools (see Annex 2), could serve as a good practice example for national authorities.** Furthermore, as recent studies showed that comprehensive domestic climate finance information – including investment needs and plans – is not

[15] EC (2017) Reflection paper on the future of EU finances, https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

readily available in most EU Member States and therefore domestic climate-expenditure tracking is very challenging (Trinomics 2017[16]; EEA 2017[17]) **the EU's climate tracking methodology (see more in Annex 3) could serve as a starting point for EU MS;** national authorities should consider adopting a similar approach, aligning their methodologies with the EU's climate markers in order to assist the delivery of a comprehensive and coherent picture of public climate-spending in the EU.

[16] Trinomics (2017) Assessing the state-of-play of climate finance tracking in Europe, http://trinomics.eu/wp-content/uploads/2017/07/State-of-play-of-European-climate-finance-tracking-published-6-July-2017.pdf
[17] EEA (2017) Financing Europe's low carbon, climate resilient future, https://www.eea.europa.eu/themes/climate/financing-europe2019s-low-carbon-climate

5 Transparency and reporting of inputs, outputs and results – conclusions, options and recommendations

5.1 Inputs tracking

The introduction of a climate tracking methodology in the 2014-2020 MFF, in response to the political commitment by the EU institutions, was a major undertaking, requiring cooperation among Commission services, and decisions on a wide range of judgements. This is a relatively new area of administrative activity, with little previous experience to serve as a model (so far as we are aware, there are no other developed economies which have attempted a similar exercise across the whole of the expenditure of a federal level of administration). A high level of detail in methodologies and a reasonable level of consistency has nevertheless been achieved. While it is outside the scope of our report, we recommend that Member State governments in the EU consider undertaking a similar exercise in the implementation of national budgets, ideally using methodologies compatible with the EU-level ones. The options and recommendations detailed in Annex 3 are summarised here.

5.1.1 Options

Drawing on the analysis from Annex 3, we have developed potential options for improving the EU approach to tracking of climate expenditure towards the 20% target These are set out in Table 5-1 below, using a simplified structure which identifies the nature of the problem and then the possible options identified. A fuller presentation in Annex 3 also gives: the intended impact of the option in terms of the effectiveness, efficiency and coherence of EU expenditure policy; and points for consideration in respect of the feasibility of the option, including any implementation risks that need to be addressed.

Table 5-1: Overview of problems and potential options

Problem	Option for change
Fund-specific recommendations (section 3 of Annex 3)	
ERDF/CF: potential for investment code approach to climate tracking to lead to over- or under-estimating of impacts of investments	Carry out a sample ex post assessment to identify potential scale of under/over-estimation.
EMFF: risk of over-estimation in application of climate markers	Revisit the allocation of markers to measures, particularly permanent cessation of fishing activities, and port investment, on the basis of evidence on climate impacts and on the underlying rationale for the measures.
EAFRD: risk of over-estimation in application of climate markers	Revisit the allocation of markers to measures, e.g. support in areas facing natural constraints, on the basis of evidence on climate impacts and on the underlying rationale for the measures. We recommend a detailed assessment of the climate results and relevance of measures in advance of future decisions on application of the climate markers.
EAGF: risk of over-estimation of climate impact	Reconsider the application of climate markers, if not for the current MFF, then for the next, on the basis of a more conservative approach. In particular, address the issues of:

Problem	Option for change
	(i) inclusion of greening expenditure for those farms which do not have to comply with the greening requirements and (ii) treatment of financial discipline. In addition, although the Commission's response to the ECA's 2016 report states that it considers its approach "sufficiently conservative", we think it is necessary to further address ECA concerns about the level at which the 40% marker is applied to cross-compliance. For future MFF, consider applying a conditional approach to assessing "significance" of contribution, based on quantified mitigation and (if possible) adaptation impacts.
LIFE, Horizon 2020: risk of inconsistent application of climate markers	Measures to improve consistency should be considered, including (for LIFE) assessment of accuracy based on a random sample, and (for H2020) a proportionate ex post evaluation of climate impacts of projects; and improved sharing of experience and best practice among officials making judgements on climate relevance.
Cross-cutting issues (section 4 of Annex 3)	
Risk of imperfect stakeholder understanding of what the 20% target means	We recommend that the largely symbolic nature of the expenditure target is made clearer, for example by expressing it as a commitment that "20% of the EU budget will contribute towards climate objectives"; and that future financial frameworks aim to identify not just the climate contribution to climate objectives, but the (ideally quantifiable) impact expected from that contribution.
Risk that tracking against the 20% target, or its successor, creates biases towards over-estimation.	To some extent, this risk can be tackled by a more rigorous and consistent approach to application of the markers, as suggested in our recommendations under section 3. In addition, wider application of ring-fenced budgets for climate action within programmes could be considered.
Tracking focuses on ex-ante commitments, not on expenditure in practice, leading to a risk of a divergence between the reported tracking results and real spending.	An ex post assessment of expenditure should be developed, based where necessary on a random sample of investments and projects This could identify any systematic differences between commitments to climate expenditure and the real nature of the projects as finally delivered, and enable the Commission to report against the political commitment underpinning the 20% target, which focuses on "EU spending", not commitments or planned expenditure.
No differentiation between mitigation and adaptation expenditure in most programmes, and in aggregate reporting.	In association with a system based on a clearer link between budgetary allocations to climate objectives, and the delivery of measurable climate outcomes, it is important to develop a tracking system based on separate identification of mitigation and adaptation impacts.
The climate markers system is less suited to areas of expenditure where it is difficult to apply granularity of judgement. The subjective nature of the judgement on allocation of markers (e.g. EAGF) has a significant impact on reported climate expenditure	In areas of the budget where judgements need to be made ex ante affecting significant amounts of expenditure, a conditional approach to the allocation of climate markers, based on (i) a clear, quantified, statement of the expected climate impact and (ii) delivery in practice of those impacts. This is linked to the broader issue of an enhanced link between expenditure and delivery of outcomes.

Problem	Option for change
Different programmes apply different climate markers to similar types of expenditure, or use different methodologies for similar activities	Attempting to homogenise the application of markers across the EU budget would be a complex undertaking. However, if the proposal in the Commission's reflection paper on the future of the EU's finances to introduce a single rule book for cohesion policy and programmes which finance similar types of investment is taken forward, the additional administrative burden would be reduced, and the opportunity should be seized to ensure a consistent approach to the application of climate markers.
Lack of clarity on the meaning of "significant" and "moderate" contributions to climate objectives	We recommend developing a more rigorous approach to applying the 100% and 40% markers, based on more objectively measurable criteria, potentially incorporating some elements of the OECD approach. Thus a "moderate" contribution could be applied only where the positive mitigation or adaptation impacts were sufficiently relevant to be identified in the impact assessment for the measure or project, and where the measure or project was identifiably designed in ways which aimed to optimise the climate policy impact. For "significant" (100% marker) mitigation impacts, we recommend an approach based on the cost-effectiveness of the climate benefit, to ensure that the benefit delivered is significant commensurate to the size of the EU budgetary contribution, by reference to a carbon price yardstick. One possible choice would be the €35 per tonne carbon price projected for the EU ETS in the impact assessment accompanying the Commission's legislative proposals for the 2030 climate package[18]. Mitigation achieved at a higher cost to the EU budget per tonne would clearly not be cost-effective, and should therefore not be regarded as "significant" in comparison to the scale of the investment. For "significant" (100% marker) adaptation impacts, quantifiable criteria are more challenging to develop. One option for a more objective, but qualitative, approach would be to apply the 100% marker only to those measures or projects with a measurable positive impact on climate vulnerabilities identified in a national adaptation strategy or in the EU adaptation strategy.

5.1.2 Recommendations

All of the options identified in Table 5-1 above should be considered by the Commission; however, as the assessment of "feasibility" (Annex 3) shows, they require differing levels of effort; and some require a judgement from the Commission as to whether to emphasise the certainty of delivery of climate outputs, or administrative simplicity. Following our own review of the individual options, the following package represents one possible attempt to combine increased impact with a proportionate approach to the administrative burden. It is grouped into two categories of recommendation; the first are those which could (if the Commission chooses) already be implemented with respect to the current Multi-Annual Financial Framework, but which are also relevant to the next MFF; and the second are those which would require action in the preparation and implementation of the next MFF.

Changes that the Commission could adopt already in the current MFF include:

[18] SWD (2014) 15 final

- Revisit the allocation of markers to measures in the EMFF, particularly permanent cessation of fishing activities, and port investment, on the basis of evidence on climate impacts and on the underlying rationale for the measures.
- For EMFF and EAFRD, revisit the allocation of climate markers to measures, particularly the permanent cessation of fishing activities measure and the areas facing natural constraints measure, in order to identify whether their respective contributions can be regarded as "significant"; in the event of any revised assessment, consider amending the relevant implementing regulation, or (as a less disruptive step) reflecting the revised assessment in the reporting of climate tracking results.
- Ensure consistently accurate presentation of the 20% objective (or the objective chosen for the next MFF), for example by referring to it as expenditure which "contributes towards climate objectives", and noting explicitly that the same expenditure may be tracked for more than one priority (e.g. biodiversity in addition to climate).

In the preparation and implementation of the next MFF, we suggest that the Commission adopts the following actions:

- For ERDF and CF, carry out a sample ex post assessment of the application of intervention codes in the 2014-2020 programmes to identify the potential scale of under/over-estimation of climate impacts, and the accuracy with which the codes are applied; and address any issues identified in the next MFF through either stricter rules on the application of intervention codes, or (see below) the use of a single methodology across EU programmes.
- For the EAGF, reconsider the application of climate markers on the basis of a more conservative approach (and reflecting the nature of the obligations applied post-2020 to EAGF beneficiaries), and in particular consider a conditional approach, assessing significance on the basis of an expected (and then delivered in practice) quantifiable contribution to mitigation and adaptation objectives, in line with the broader approach with regard to the "significant" and "moderate" markers suggested below.
- If the proposal in the Commission's reflection paper on the future of the EU's finances to introduce a single rule book for cohesion policy and programmes which finance similar types of investment is taken forward, take the opportunity to ensure a consistent approach to the application of climate markers for similar types of investment.
- We recommend developing a more rigorous approach to applying the 100% and 40% markers, based on more objectively measurable criteria, potentially incorporating some elements of the OECD approach:
    - Thus a "moderate" contribution could be applied only where the positive mitigation or adaptation impacts were sufficiently relevant to be identified in the impact assessment for the measure or project, and where the measure or project was identifiably designed in ways which aimed to optimise the climate policy impact.
    - For "significant" (100% marker) mitigation impacts, we recommend an approach based on the cost-effectiveness of the climate benefit, to ensure that the benefit delivered is significant commensurate to the size of the EU budgetary contribution, by reference to a carbon price yardstick. One possible choice would be the €35 per tonne carbon price projected for the EU ETS in the impact assessment[19] accompanying the Commission's legislative proposals for the 2030 climate package. Mitigation achieved at a higher cost to the EU budget per tonne would clearly not be cost-effective, and should therefore not be regarded as "significant" in comparison to the scale of the investment.
    - For "significant" (100% marker) adaptation impacts, quantifiable criteria are more challenging to develop. One option for a more objective, but qualitative, approach would be to apply the 100% marker only to those measures or projects with a measurable positive impact on climate vulnerabilities identified in a national adaptation strategy or in the EU adaptation strategy.

[19] European Commission SWD(2014) 15 Final. Impact assessment accompanying the document: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions
A policy framework for climate and energy in the period from 2020 up to 2030

5.2 Outputs/ mobilised investment tracking

The primary objective of activity in this area is to track and measure the extent to which the EU is succeeding in helping to mobilise private finance to address the causes and impacts of climate change.

The need to mobilise additional private sector finance is based on the assumption that the scale of action required is very large, and that there are some barriers to attracting private finance to activities in this area that the EU can help address. The tracking and measurement is needed to provide feedback on the success of EU activity, i.e. if it appears that the amount of finance being provided by EU facilitated activity is not large enough to have any impact then this would suggest the potential need for additional and/ or redesigned activity. The conclusions, options and recommendations detailed in Annex 4 are summarised here.

5.2.1 Conclusions

In Annex 4 we present an analysis of tracking outputs and mobilised investment and this suggests a several areas where the tracking of mobilised investment could be improved**.** These include inconsistencies in approaches and gaps in coverage, which means that the information that is available on the climate finance that is mobilised/leveraged by EU financial instruments is incomplete and inconsistent. There is also a risk of double counting with other public sources. These problems mean the Commission is unable to generate a single mobilised/leveraged finance figure for the EU financial instruments. The problems can be associated with the following issues:

- *Lack of definition of what constitutes an EU FI* – no complete list of FIs and no agreed criteria to populate such a list.
- *Lack of consistency (or existence) of climate 'windows' in FIs* – no consistent way of defining how much (if any) of each FI should be directed towards climate relevant action. This issue is covered in more detail in Annex 3 as it crosses over both programmes and FIs
- *Lack of consistency (or existence) of procedures to report climate relevant outputs and impacts* – this is covered in much more detail in Annex 5 as the issue crosses over both programmes and FIs
- *Lack of consistency on measurement and reporting of leverage* – to indicate the additional funds made available in addition to those supplied by the EU.

5.2.2 Options

The following options for improvement were analysed (full analysis in Annex 4).

Table 5-2: Problems and policy options considered in relation to outputs/mobilised investment tracking

Problem	Policy options considered
Lack of definition of what constitutes an EU FI	No-policy change.
	Guidance on what should be included in an FI list – with responsibility assigned to appropriate DGs (e.g. DG ECFIN have the current responsibility to oversee FIs).
Lack of consistency (or existence) of climate windows in FIs	No-policy change.
	Mandatory CC windows in all EU FIs.
	Mandatory rules on the publication of existing information (on the CC relevance).
	FI specific review of the burden of collecting and collating loan specific data (where missing).
	Develop a document that describes what existing data should be made available, and what gaps exist.
	For limited CC relevance / micro loan FIs. estimate CC impact

	based on a sample / desk top review.
Lack of consistency on measurement and reporting of leverage	No-policy change.
	Mandatory reporting requirements with a flexible / categorised definition of leverage (in line with the Multilateral Development Banks' (MDB) approach).
	Voluntary reporting requirements with a flexible / categorised definition of leverage.
	Guidance on reporting requirements with a flexible / categorised definition of leverage (in line with the MDB approach).

5.2.3 Recommendations

The combination of actions which appears the most promising from our analysis is as follows:

Prepare guidance on what should be included in an FI list. This is the vital first step in arriving at a reliable figure on the total amount of finance mobilised by EU FIs, and the percentage of this figure which is climate relevant. The simplification of EU FI procedures and definitions as suggested in the recent Commission reflection paper on the future of EU finances and in the more detailed recommendations on rules (e.g. standardise rules for EFSI and Cohesion funds) from the High-Level Group on Simplification would make this process simpler.

A mandatory CC 'window' / allocation should not be considered for existing FIs, but should be considered for all new and revised FIs. The benefits are not justified by the technical, legal and administrative burdens of doing this for existing FIs, but this should be considered when FIs are being created or substantially revised. The current process for EFSI 2.0 appears to offer a good model. It is highly likely that for some FIs this will not be appropriate and mainstreaming alone will be required. The definition of a CC window would need to be discussed and agreed and should be consistent with that used for assessing the contribution from other EU spending programmes.

Efforts should be made to fully utilise existing data (on the nature of the individual loans) to enable accurate CC impacts to be estimated (and /or monitored). For example, the EIB have information on the CC relevance of some of the FIs that they operate for the EU (though typically not those via intermediaries). We suggest that this information should be collated and made public (subject to any confidentiality issues).

Carry out an FI specific review of the burden of collecting and collating loan specific data, where it is not currently available. This would enable the feasibility of achieving a comprehensive identification of climate relevant spending. This will not be justified in some cases – see next point.

For limited CC relevance / micro loan FIs estimate CC impact based on a sample / desk top review - For those programmes where the end loans are very small (e.g. less than €100k), or have limited CC relevance, it would be overly burdensome to collect and collate data on every individual loan. In these cases, it appears reasonable to select and asses a sample to produce an estimate of CC relevance - this would ensure that all contributions are captured, and that data is captured on FIs which could support some positive CC impact.

Prepare guidance, with a voluntary reporting requirement, with a flexible / categorised definition of leverage in line with the MDB approach – This approach would allow a full discussion of the available options on the treatment of leverage and would allow the flexibility that is likely to be required to reflect the varying policy and sectoral contexts that EU FIs operate in. In combination with the above recommendations it would enable the calculation of a total figure for the amount of finance enabled by EU FIs and the amount of this finance that is climate relevant.

5.3 Results tracking

The approach to tracking of climate-relevant results was assessed for selected budget programmes. This included a review of the current indicators, methodologies and guidelines used to support tracking. Further details are provided in Annex 5.

5.3.1 Conclusions

The followings conclusions were drawn from the review of the current approaches:

- For the majority of the budget programmes, common frameworks were identified for the development and monitoring of climate related indicators. These are set as part of Union legislation so have a strong legal basis.
- There are though some potential gaps in the current framework. For example, both ESF and Copernicus have specific climate related objectives, but do not appear to have defined specific climate related indicators, despite targeting climate in their objectives. Likewise, the framework for FIs appears to be less comprehensives, with no climate relate indicators identified for a number of the instruments that were examined.
- The common frameworks tend to focus on output indicators. Outputs are relatively easy to define, monitor and report, and can be tailored to the specific characteristics of the budget programmes. This has led to a large number of indicators, and only limited harmonisation across different budget programmes. Moreover, these output indicators only provide a partial picture of the actual results from the climate-relevant indicators.
- In contrast, 'results' and/or 'impact' indicators provide a more complete assessment of how EU expenditure on the budget programmes has contributed towards the EU's climate objectives. In relation to mitigation impacts, there has been a general harmonisation around the use of GHG savings as the key results indicator. No results indicators were identified for any budget programmes in relation to climate change adaption action – although there are some output indicators relating to climate resilience.
- The review identified some potential inconsistencies in definitions of the different types of indicators, between programmes. For example, where EAFRD and EAGF refer to impact indicators as 'reflecting the areas where the CAP is expected to have an influence' and CF and ERDF refer to impact as 'the change that can credibly be attributed to an intervention'.
- The results framework is established at budget programme level. However, implementation of indicators, and the monitoring and modelling of results, varies by programme, e.g. it may be at the level of the operational programme, multi-annual work programme, or at project level. To help ensure consistency in the development of indicators, some budget programme have developed guidelines to support Member States or project beneficiaries.
- Additional guidance has also been developed by budget programmes to support the consistent calculation and reporting of indicators, particularly where this involves quantitative information. Across the different budget programmes the methodological approaches to model results generally follow the same principle across guidance documents, e.g. establish a baseline; measure/ model the result of the activity; subtract the latter from the former to determine the impact. This consistency helps to make the results indicators more comparable. However, there are some variations in the methodologies, including the data sources that are recommended for use, and the quantification approaches themselves. These differences make the results less consistent, and reduces comparability.
- The metrics required to adequately apply this method can only be determined according to the activity data; thus, even at project level, impacts are monitored and modelled at component level and then scaled up to project level. For reporting purposes these are then aggregated further to funding programme level which means that some of the detail outlining the metrics used is lost and therefore some of the transparency of reporting is compromised.
- The inconsistencies and gaps identified above make it very difficult to meaningfully compare the results of climate-related expenditure. Some comparisons are possible for those budget programmes that report similar indicators. However, any comparisons should be treated with caution given the different definitions and approaches. Moreover, as a result of the gaps in the framework, the estimates will represent an underestimate of the total GHG savings from mitigation actions.

5.3.2 Options

A number of issues were identified which, acting together, led to problems with the **comparability** of climate-related results across different programme areas and financial instruments, limited the

completeness of information reported on the climate-related results of the EU Budget, and also the **accuracy** of information reported on the climate-related results.

The following options for improvement were analysed (full analysis in Annex 5)

Table 5-3: Issues and options considered in relation to results tracking

Issue	Options
1. Inconsistencies in indicator definitions, and in the use of specific indicators	a) Full harmonisation of all climate relevant indicators across all budget programme regulations.
	b) Harmonisation of some climate relevant indicators across all budget programme regulations i.e. not aiming to harmonise across all indicators.
	c) Harmonisation of some climate relevant indicators across some budget programme regulations i.e. not aiming to harmonise fully across all programmes
2. Inconsistencies and gaps in methodologies to calculate the indicators	a) Establish common methodologies, based on existing best practice, for mandatory use by all budget programmes.
	b) Establish common methodologies, based on existing best practice, for voluntary use by budget programmes.
	c) Further development and better signposting of existing guidance which could be used voluntarily by different budget programmes.
3. Inconsistencies and lack of transparency in aggregation and reporting of results	a) Establish common framework and tools for aggregation and reporting of indicators at budget programme and FI level.
	b) Establish minimum content for reporting aggregation methods and results data, and harmonisation of existing tools.

5.3.3 Recommendations

Following the review of the individual options, the following options are recommended for further consideration by the Commission.

5.3.3.1 Harmonisation of headline indicators for climate relevant results

We recommend that the Commission considers the further harmonisation of the climate relevant results indicators across selected budget programmes and FIs. This harmonisation should be focused around a core set of indicators which should be reported consistently for those budget programmes which have significant levels of climate-related expenditure, and for which the calculation of the results indicator is considered sufficiently robust.

Suggested headline indicators are proposed below. The indicators consider the prevalence of the indicators already established by programmes; the anticipated ease against which such indicators could be monitored and reported against; and their relevance to reporting meaningful results which capture the results of climate action (e.g. reporting the number of projects delivering climate actions does not capture the size of the projects and therefore would not capture meaningful results). For example, the headline indicators for adaptation actions are output indicators rather than result indicators owing to the inherent difficulties associated with monitoring and reporting results indicators for such actions.

Table 5-4: Potential headline indicators for the MFF

Type of indicator	Type of climate action	Proposed headline indicator
Result	Mitigation	GHG emissions savings
Result	Mitigation	Energy intensity
Result	Mitigation	Additional capacity of renewable energy production
Output	Adaptation	Population benefiting from adaptive measures
Output	Governance	Outreach – measured by population/ number of organisations/ number of holdings under contract/ number of advisors trained/ etc.

5.3.3.2 Further development of existing calculation methodologies

We recommend that the Commission further develops existing calculation methodologies.

For programmes that support large infrastructure projects, the guidelines developed by the EIB for the assessment of project GHG emissions could provide a basis for the harmonisation of the main methodological steps to be followed (e.g. determine baselines, cut-off rules) but also the datasets and values for key parameters used in calculation e.g. emissions factor. In this way, programmes may be allowed flexibility in the calculation approaches that are applied, but the values for key parameters could be harmonised. These values could be integrated into other existing models and guidelines, such as the CO2MPARE tool developed for the ERDF/CF. The further expansion of this tool to other programme areas could also be explored.

One area where further development of methodologies would be beneficial is with respect to the emissions from the agriculture sectors (EAFRD/EAGF). Given the challenges with the bottom up assessment of measures in this sector, the approaches might apply top down methods, such as decomposition analysis to isolate the policy drivers, from non-policy drivers. These methodologies might be more appropriately applied at EU level, as part of future evaluations of these programmes.

5.3.3.3 Development of the reporting tools and approach

Existing reporting tools have been developed for the different programmes, and are embedded in the relevant regulations. However, there is no common approach to present the indicators, or information on the underlying methods – including aggregation. We recommend that the Commission explore the further harmonisation of these reporting tools, to enable a more consistent reporting of the indicators at the EU budget level.

5.3.4 Reporting on the greenhouse gas reduction profile of the MFF

The majority of mitigation related expenditure is estimated to occur for six budget programmes (ERDF, CF. H2020, CEF, EAFRD and EAGF) An overview of the information available on the planned GHG reductions which Member States estimate will occur from the planned programmes they will implement is given in Annex 5. Estimates of GHG reductions for operational programmes or projects in Member States are available for only three of these budget programmes ERDF, CF and Horizon 2020, which together account for almost one half of estimated mitigation related expenditure. For the three other programmes (CEF, EAFRD and EAGF), there is currently no requirement for Member States or COM to report on GHG reductions achieved, although in the case of EAFRD, reporting of some related indicators is required, for programme elements aimed at reducing GHG or ammonia emissions.

The estimated reductions reported in Annex 5 are uncertain, and almost certainly do not capture the total effect of the budgetary programmes on GHG emissions. However, they represent the best estimates available at present. For the ERDF and CF budget programmes, reporting of GHG reductions is concentrated on those programme elements meeting the thematic objective of a low carbon economy. Under this thematic objective, which is estimated to account for about 80% of total mitigation related expenditure for these budget programmes, operational programme elements are most likely to be focused on actions where the primary objective is to reduce energy consumption, thus delivering GHG savings, or support low carbon forms of energy. Other mitigation related

expenditure within the programme is likely to be from actions (typically given a 40% Rio Marker) where the focus is elsewhere, e.g. improved transport infrastructure or improved resource or waste management and GHG reductions are a co-benefit. Estimating GHG reductions from these types of actions will typically be more complex, and there may be a number of secondary effects to assess, before the net GHG reduction achieved can be estimated. It is also possible that spending in areas which are not identified as climate expenditure may lead to either an increase or reduction in GHG emissions, but these potential impacts on emissions are not captured by the reporting systems currently in place.

In the case of H2020, data is available for a subset of projects focussed on energy efficiency and system integration projects, which account for only 5% of the estimated mitigation related expenditure for the H2020 budget programme. Reliable estimates of GHG savings were only available for a small subset of these projects. Applying the average GHG reduction achieved per unit of expenditure to the remaining energy efficiency and system integration projects increases the estimated reductions by 79 Mt CO_2 per year.

The estimate of total GHG reductions achieved by the three budget programmes for which estimates are available is therefore 122 Mt CO_2 per year by 2020. For these three budget programmes, it is likely that in reality GHG reductions may be larger than this as reductions have not been estimated for all elements in these budget programmes where CRE was identified, and there may be budgetary expenditure which is not identified as CRE which results in GHG reductions. In addition there are a number of budget programmes with CRE which might be expected to result in GHG reductions but for which GHG reductions are not estimated.

There is a need to consider whether all of these total estimated GHG reductions can be attributed to the EU contribution to the budget programme, or whether the reductions should be apportioned between the EU contribution and national funding. If this approach was adopted then the total reductions estimated for the programme would be reduced. However, it could also be argued that actions, particularly infrastructure investments might not have taken place without EU co-financing.

5.4 Transparency and reporting

A review was performed of the over-arching systems for reporting progress on the different climate-relevant components of the budget. The conclusions, options and recommendations detailed in Annex 6 are summarised here.

5.4.1 Conclusions

There are already a large number of different reports, tools and datasets which cover the selected budget programmes and FIs. That is not to say that there are no areas of improvement, but there are some strong foundations – at least for some budget programmes – that can be built upon.

In relation to climate inputs the draft general budget and associated working documents provides a single source where information is available on the climate-related expenditure of each of the budget programmes in a consistent format. However, the report only provides the results from applying the EU's tracking approach, and not the detailed assumptions that have been applied. The transparency of the reporting could be enhanced if further information was reported on how the climate tracking approach has been applied.

With respect to the reporting of information on FIs, then for centrally managed funds, the Commission's report on financial instruments supported by the general budget according to Art.140.8, provides a consistent and comparable source of information on financial performance. However, this report lacks any information which enables a mapping of the FIs to different areas of climate expenditure, and therefore the overall contribution of the FIs to the EU's climate objectives.

For FIs under shared management, the instruments under the European Structural and Investment Funds (ESIF) are also reported annually in accordance with Article 46 of Regulation (EU) No 1303/2013. This report has certain elements of best practice from a transparency perspective, as it clearly describes the process that are used to collected the data, the quality check the data and to further process the data. However, as with the Art 140.8 report, this also lack information on the climate-related expenditure and associated outputs.

Reporting of information on climate related results follows a similar trend as for inputs and outputs, but is arguably more fragmented. This is because the indicators, methodologies and tools used to assess the climate relevant impacts are more diverse, and less consistent (See Annex 5), than for inputs, or outputs. There is some harmonisation of reporting under the common reporting framework, but this is only for related programmes and not the budget as a whole.

To support the reporting different templates or tools have been developed. These templates can aid the comparability of climate-relevant information that is available; in the case of the Programme Statements of operational expenditure the same table is used to report climate related expenditure for each budget programme. For the reporting of project and programme data, including performance indicators, different tools (including IT platforms) have been developed. These platforms allow certain climate-relevant performance indicators to be extracted and further analysed (see Annex 5). However, while the structure of these datasets is consistent for the project/programmes within the scope of the tools, it is not necessarily consistent across all of the budget programmes. Moreover, there is no single data set which brings together the results over the different budget programmes and FIs, which means that individual datasets need to be analysed separately and then aggregated together to get a more complete picture at EU budget level.

5.4.2 Options and recommendations

As described above, the analysis identified a number of issues which, acting together, led to problems with inconsistencies in the information that is available on the climate-related elements of different programme areas and financial instruments, and limited the transparency of information reported on the climate-related results of the EU Budget.

For each of the broad problem areas described above, a number of potential improvement options have been identified. In the subsequent sections for each of the options we have assessed the relative effectiveness of the options in delivering the objectives and the efficiency (i.e. administrative burden) of doing so.

5.4.2.1 Inconsistencies between budget programmes on the information that is reported and the reporting format

The options for improvement in relation to this problem area might include:

- Full harmonisation of the information reported and associated tools. Building on the reporting required under the draft budget/programme statements, his would involve the full harmonisation of reporting of information on inputs, outputs and results across all budget programmes, and the inclusion of information for FIs. It would also involve the harmonisation of the IT reporting tools across programmes i.e. a central tool across all budget programmes for climate relevant information
- Full harmonisation of the information reported and partial harmonisation of the associated tools. This would also require the harmonised reporting of more complete information on inputs/outputs/results across programme budgets, but would not require the harmonisation of project level data in a single IT tool. Instead, there would be a requirement to compile certain aggregated data in separate tools
- Full harmonisation of the information reported, but no harmonisation of the associated tools. The would be as the option above, but in this case no attempts would be made to draw together the data into a central repository – only the summary data would be reported.

Full harmonisation would be most effective, but is unlikely to be feasible – particularly in relation to the IT elements. The preferred approach would therefore the full harmonisation of reporting requirements, but not harmonisation of the tools.

5.4.2.2 Lack of transparency in the methodologies applied

The options for improvement in relation to this problem area might include:

- Introduce a requirement, as part of the individual budget programme regulations, for each programme (above a certain significance threshold) to prepare a detailed report on the climate relevant actions and associated methodologies. The reports would be required to follow a specific template, which would include information on the methodologies that have been applied in the e.g. calculation of the climate relevant expenditure, aggregation of impacts data. The reports would be required on a biennial basis.

- Introduce a requirement, as part of the individual budget programme regulations, for each programme (above a certain significance threshold) to prepare a report on the climate relevant actions and associated methodologies. The reports would be similar to the option above, but would be more limited in scope (i.e. not as much detail) or less frequent (e.g. every 4 years).
- Introduce a new climate reporting regulation. This would require the same information to be reported as in either of the option above, but the legal basis would be a new climate reporting regulation, rather than requirements in individual regulations. This would also apply to relevant FIs. It could also specify certain methodologies (see Annex 5).
- Introduce a voluntary template for reporting, but do not make a legal requirement

There is no clearly preferred option. Making detailed reporting a legal requirement would be most effective, but also most burdensome, and this would also make it less feasible. However, in practice most budget programmes with climate relevant elements already capture information e.g. on the approach to tracking, so this would just formalise what is already done.

5.4.2.3 Lack of overall framework to bring together the overall climate related input, output and results data at programme and EU budget level.

The options for improvement in relation to this problem area might include:

- Further expand existing reporting mechanisms to capture climate relevant elements. This would build upon the existing reporting mechanism e.g. draft budget/programme statements, Article 140.8 report, or the Annual Activity Report and Annual management and Performance report of the EU Budget, to introduce further requirements to report additional information on the climate related elements of the programmes and FIs. There would also be a need to streamline reporting with other energy and climate reporting requirements, including Member States' Energy and Climate plans – which may include data on planned investments.
- Introduce the requirement for the Commission to prepare a regular report on the climate relevant impacts of the overall budget. This would be a new requirement, and new output, which would focus just on the climate relevant elements of the budget. This would require the Commission to prepare a report every other year, summarising the progress that the budget has made delivering the EU's overall climate objectives. This report would bring together performance information across the whole logic chain, from inputs, outputs and results. It would encompass all those EU budget programmes reporting climate related expenditure, and would also include the relevant FIs. For each budget programmes/FIs, the report would track the flow of climate related expenditure, and the outputs and results associated with the expenditure. The report would first be expressed at programme level, but then for the budget as a whole. This could potentially be prepared alongside the Annual management and performance report of the EU budget.

There is no clearly preferred option. The requirement for the Commission to report separately on climate relevant elements of the budget might though ensure that sufficient attention is given to the activity and ensure that all relevant information is available in one place.

6 Summary of recommendations

In the previous sections, individual recommendations have been developed for each of the areas of analysis, namely: investment needs, climate mainstreaming and tracking and reporting. A number of these general recommendations are common to more than one area, and we draw these together here as a summary in respect of common themes.

In practice, the majority of recommendations relate to specific actions that could be taken by the European Commission in the next MFF, and these frequently relate to updates/refinements to the existing processes and systems. This includes the various rules, methodologies and tools which have been developed to date.

The recommendations have been developed taking into account the relative effectiveness and efficiency of the different options. Nevertheless, a balance needs to be struck between the benefits arising from the implementation of the recommendations and the administrative burdens.

6.1 Development of further guidance

Additional guidance can help to guide climate mainstreaming activities within budget programmes, but also ensure greater consistency in the approaches taken. A number of good examples were identified in the review, but some areas of strengthening were also identified. This led to the following recommendations.

- **"Single rule book"/ investment guidelines for climate mainstreaming.** Building on the suggestion of the Commission's reflection paper on the future of EU finances we recommend the consideration of a "single rule book" for similar types of investments which could include a set of tools to support climate mainstreaming in a horizontal way. This may include: establishment of key climate-relevant ex ante conditionalities; more extensive use of climate considerations in CBA for EU investment decisions, together with vulnerability and risk assessments; and, development of common methodologies for monitoring climate expenditure on similar types of investment under different parts of the EU budget
- **Guidance on what should be included in a list of FIs under the EU budget.** The development of some further guidance in this area is an important first step in arriving at a reliable figure on the total amount of finance mobilised by EU FIs, and the percentage of this figure which is climate relevant. The simplification of EU FI procedures and definitions as suggested in the recent Commission reflection paper on the future of EU finances and in the more detailed recommendations on rules (e.g. standardise rules for EFSI and Cohesion funds) from the High Level Group on Simplification would make this process simpler.
- **Guidance, in line with the MDB approach, to support the reporting of leverage by climate relevant FIs**. The further development of guidance will support more consistent reporting. The guidance should include a full discussion of the available options on the treatment of leverage and should also allow the flexibility that is likely to be required to reflect the varying policy and sectoral contexts that EU FIs operate in.
- **A greater focus on the use of guidance in practice, and a commitment to learn from experience.** Where guidance has been developed to support climate mainstreaming it is important to understand how the guidance is used in practice. It was not obvious from our review if and how some of the guidance that had been prepared was used. We therefore recommend a greater focus on monitoring and evaluating, in a proportionate way, the usefulness of guidance, and the needs and preferences of those targeted by the guidance.

6.2 Development of further tools and methodologies

For some elements of mainstreaming and tracking, the further development of tools and methodologies will enhance existing activities, for example by addressing knowledge gaps and sharing best practice. The following specific recommendations were made in this area:

- **Harmonised methodologies for the calculation of GHG impacts.** For programmes that support large infrastructure projects, the guidelines developed by the EIB for the assessment

of project GHG emissions could provide a basis for the harmonisation of the main methodological steps to be followed (e.g. determine baselines, cut-off rules) but also the datasets and values for key parameters used in calculation e.g. emissions factor. In this way, programmes may be allowed flexibility in the calculation approaches that are applied, but the values for key parameters could be harmonised. These values could be integrated into other existing models and guidelines, such as the CO2MPARE tool developed for the ERDF/CF. The further expansion of this tool to other programme areas could also be explored.

- **For financial instruments, efforts should be made to fully utilise existing data (on the nature of the individual loans) to enable accurate climate change impacts to be estimated (and /or monitored).** For example, the EIB have information on the climate change relevance of some of the FIs that they operate for the EU (though typically not those via intermediaries). We suggest that this information should be collated and made public (subject to any confidentiality issues).

6.3 Ensure that methodologies are applied consistently

Even where methodologies have been developed, it may still be necessary to ensure that they are applied consistently. This may require some further moderation of the approaches taken, to ensure more consistent application. The following specific recommendations were identified:

- **Revisit the allocation of climate markers**. To ensure consistent application of the climate markers we recommend that the allocation of markers is reviewed for certain budget programmes. This should, in particular, involve a more detailed and rigorous approach to identifying “significant” and “moderate” contributions, and exclude expenditure where climate impacts are not sufficiently significant to have been a consideration in decision-making.
- **Ensure a consistently accurate presentation of the 20 % objective** (or the objective chosen for the next MFF), for example by referring to it as expenditure which “contributes towards climate objectives”, and noting explicitly that the same expenditure may be tracked for more than one priority (e.g. biodiversity in addition to climate).

6.4 Establish some new requirements

For some areas it was recommended that the some new requirements should be considered for introduction to support mainstreaming activities. These requirements would strengthen the focus on climate mainstreaming but would have to be balanced against other objectives. Recommendations in this area include:

- **Require climate mainstreaming to be considered for all investment areas**. In order not to limit climate mainstreaming to direct climate allocations but to also encourage broader mainstreaming we suggest that specific reporting requirements should be introduced in the legal basis of relevant programmes on more general mainstreaming of climate into other investment areas.
- **Earmark climate funding**. The establishment of minimum spending requirements on climate objectives or earmarking of climate resources should be considered more extensively in the future MFF funding programmes on a case-by-case basis and should be included in the relevant fund-specific regulations, bearing in mind not to exceedingly constrain flexibility within the programmes. **Consideration of a mandatory climate change ‘window’ for all new and substantially revised FIs.** The current process for EFSI 2.0 appears to offer a good model to follow for such an approach. It is highly likely that for some FIs this will not be appropriate and mainstreaming alone will be required. Also, the definition of a climate change window would need to be discussed and agreed and should be consistent with that used for assessing the contribution from other EU spending programmes.
- **Separate climate mitigation and adaptation mainstreaming targets** in order to ensure that attention is paid to both objectives. As a first step towards this long-term goal, the Commission could identify those EU funds which would benefit from having separate mitigation and adaptation targets (e.g. if a fund is found to focus largely on mitigation actions and does not exploit its potential in adaptation, separate targets could ensure greater focus on adaptation outcomes without damaging mitigation benefits).

6.5 Perform some further research and analysis

In some areas, it was recommended that some further analysis be performed to improve the evidence base to support decision making around climate mainstreaming. The relevant example was:

- **Further analyse all EU programmes to identify those which are the most capable of delivering climate objectives.** For this process we suggest the use of a traffic-light system, reflecting on the total budget of the programmes, the climate contributions, and their potential to deliver climate outputs in the short and the long-term. This analysis would lead to a Commission-wide process to identify priorities for climate expenditure in the post-2020 MFF and has the potential to significantly increase the coherence of climate mainstreaming and to actively encourage the integration of climate objectives into EU funds. It could also be linked to a process for setting more explicit targets for the climate mitigation and adaptation contributions expected from different parts of the budget.

6.6 Improving linkages with other requirements

The review identified several areas where better linkages could be made with other activities ongoing at EU and Member States level concerning similar issues. The specific recommendations were:

- **Create a link between the monitoring of climate contributions through shared management programmes, and the National Energy and Climate Plans (NECPs)** under the currently negotiated Regulation on the Governance of the Energy Union. In particular, the NECPs could serve as an instrument for Member States to set their ambitions regarding mitigation and adaptation activities and the corresponding investments to meet those ambitions.
- **Establish a stronger link between allocations for mitigation actions and their contributions to the overall delivery of EU and Member State climate objectives**. In the case of ESIF, these could be linked to the national GHG emission reduction targets.
- **Make greater use of vulnerability and risk assessments and in particular creating a closer link between National Adaptation Strategies and EU allocations to adaptation.**

Annexes

Annex 1: Investment needs to meet EU 2030 and 2050 climate and energy targets

Annex 2: Analysis of existing approaches and processes of mainstreaming in EU instruments

Annex 3: Input tracking

Annex 4: Output/mobilised investment tracking

Annex 5: Results tracking

Annex 6: Transparency and reporting

Annex 1: Investment needs to meet EU 2030 and 2050 climate and energy targets

1 Introduction and objectives

1.1 Policy context

1.1.1 EU Energy and Climate commitments

The European Commission is looking at cost-efficient ways to make the European economy more climate-friendly and less energy consuming. Its low-carbon economy roadmap[20] suggests that by 2050, the EU should cut greenhouse gas emissions to 80 % below 1990 levels. Milestones to achieve this are 20 % emissions cuts by 2020[21], and 40 % by 2030[22]. Alongside these mitigation targets, the EU adaptation strategy helps to ensure that adaptation considerations are addressed in all relevant EU policies.

The delivery of the EU's climate objectives will require significant investment. At the time that the Europe 2020 Strategy was adopted, it was estimated that by 2020 public and private investment of ~€125 billion per annum would be needed to carry out climate mitigation actions across all sectors (including agriculture, buildings, energy, industry, transport, and waste). Further investment is also necessary for climate adaptation actions; and climate resilience needs to be built in to all long-term investments.

1.1.2 The Multiannual financial framework (MFF)

The multiannual financial framework (MFF) provides a framework for financial programming at the EU level. It lays down the maximum annual amounts ('ceilings') which the EU may spend in different political fields ('headings') over a period of at least 5 years. It also allows the EU to carry out common policies over a period that is long enough to make them effective. This long-term vision is important for potential beneficiaries of EU funds, co-financing authorities as well as national treasuries.

With a view to responding to the challenges and investment needs related to climate action, the European Commission is implementing a mainstreaming methodology during the current (2014-2020) MFF including by aiming to make at least 20 % of EU expenditure climate related.[23] The 'reflection paper on the future of EU finances'[24] published by the European Commission in late June 2017 further emphasises this aim to streamline and simplify the EU budget system in order to facilitate more efficient spending.

1.2 Objectives of the report

The objectives of this report are to provide a review of how the current (2014-2020) MFF arrangements for mainstreaming, and for tracking climate-related expenditure and its achievements, have operated in practice; and to make recommendations for potential options for improving the current approach and processes.

1.2.1 Scope of the current report

As part of the report a review has been performed of the different approaches that have been taken to mainstream climate change issues into EU budget programmes and financial instruments, as well as the approaches to track climate expenditure (inputs) through budget programmes, the leverage of investment from financial instruments (outputs) as well as the overall effects of these investments on greenhouse gas emissions and climate adaption actions (results).

[20] COM(2011) 112, A roadmap for moving to a competitive low carbon economy by 2050. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0112
[21] COM (2010) 639, Energy 2020. A strategy for competitive, sustainable and secure energy. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1409650806265&uri=CELEX:52010DC0639
[22] COM(2014) 15, A policy framework for climate and energy in the period from 2020 to 2030. Available at: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52014DC0015
[23] COM(2011) 500, A budget for Europe 2020. Available at http://eur-lex.europa.eu/resource.html?uri=cellar:d0e5c248-4e35-450f-8e30-3472afbc7a7e.0011.02/DOC_4&format=PDF
[24] COM(2017) 358, Reflection paper on the future of EU finances. Available at: https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

Separate reports have been prepared for each of the different elements of the review (mainstreaming, inputs, outputs, results), along with the current report assessing the investment needs associated with the EU's climate targets.

2 Role of the EU budget in delivering the EU's climate and energy targets

Exploring the role that the EU budget can play in the delivery of the EU's 2030 and 2050 climate and energy targets requires an exploration of the overall estimated investment needs to achieve these targets, but also an analysis of the role or contribution that the EU budget can or should make towards meeting those needs in the light of resources potentially available from the private sector, and from national budgets.

The specific objectives are to:

- Collect existing data on the overall estimated investment needs required to deliver the EU's 2030 and 2050 target;
- Collate views on the potential contribution of the EU budget towards the overall investment levels, and;
- Collate views on the sectors in which public spending can make the effective contribution, and with which tools.

To deliver these objectives, we have organised the work in two activities, one relating to the review of overall investment needs, and one placing the role of the EU's budget into this wider context. The results from this work are presented below.

2.1 Investment needed to deliver the EU's 2030 and 2050 climate and energy targets

In this section, we assess the estimated investments required to achieve the EU climate and energy goals and targets for 2030 and 2050. We begin by providing a short narrative of the methodology used for this analysis (section 2.1.1).

Since the 2030 and 2050 energy and climate targets and associated policy measures are quite different for climate mitigation versus climate adaptation, and consequently the available literature and data sources, the analysis of EU-level investment needs for climate mitigation and climate adaptation are not easily discussed together. The analysis of investment needs has therefore been made separately for the two main climate change challenges (sections 2.1.2 and 2.1.3 respectively).

2.1.1 Methodology

The estimation of overall investments needs is based on a literature review and own (data) analysis of the contractor. The analysis draws on previous and ongoing studies to collate information on estimates of EU investment needs across various sectors. This includes work carried out directly by our project team for DG Energy[25], the European Parliament[26], the European Environment Agency[27] and several EU Member State governments[28].

For each of the main studies we have gathered data on the basic characteristics of the studies, and the associated estimates of investments. In addition to the investment needs estimate figure, such additional information is important to gauge the comparability of the existing investment needs estimations. For example:

[25] Rademaekers, K, et al (2017). Assessing the European clean energy finance landscape, with implications for improved macro-economic modelling. Deliverable 3 of the Study on the Macroeconomics of Energy and Climate Policies. European Commission, DG Energy. https://ec.europa.eu/energy/sites/ener/files/documents/macro_eu_clean_energy_finance_final.pdf

[26] European Parliament (2017). European Energy Industry Investments. Historic trends in actual spending for various periods as underlying Figure 8 on p. 35. http://www.europarl.europa.eu/RegData/etudes/STUD/2017/595356/IPOL_STU(2017)595356_EN.pdf

[27] Trinomics (2017) 'State-of-Play of European climate finance tracking'. Available at: http://trinomics.eu/wp-content/uploads/2017/07/State-of-play-of-European-climate-finance-tracking-published-6-July-2017.pdf

[28] Rademaekers et al (2016). Landscape of climate finance in Belgium. Federal Public Service (FPS) Health, Food Chain Safety and Environment, Belgium. http://www.klimaat.be/files/4914/6901/4152/Landscape_of_climate_finance_in_Belgium.pdf; and Hainaut et al (2015). Landscape of climate finance in France 2011-2014. I4CE Institute for Climate Economics. http://www.i4ce.org/download/landscape-of-climate-finance-in-france-2015-edition-full-report/?wpdmdl=13071; and Juergens et al (2012). The landscape of climate finance in Germany. Climate Policy Initiative. http://climatepolicyinitiative.org/wp-content/uploads/2012/11/Landscape-of-Climate-Finance-in-Germany-Full-Report.pdf

- The different estimated values for the total investment needs (with large methodological uncertainties) are influenced by different modelling mechanisms, framework parameters and conventions for cost-estimations. Often, the results have a different timeframe and geographical coverage;
- The future investment needs results are strongly influenced by the assumptions on energy demand and primary energy and GHG-allowances prices, technological developments in energy transformation and end-user applications (e.g. learning rates). Distribution grid costs are often omitted, which poses doubt on the investment estimates of total grid costs.

Such 'scoping' information includes, in particular, the following characteristics:

- ✓ **Climate (sub-)sector** – broadly speaking energy supply, energy infrastructure (transmission, distribution, interconnections), energy demand (industry, households, tertiary, transport), non-energy sectors (agriculture, land use, waste, industrial emissions), adaptation (different sectors).
- ✓ **Sources of finance** – to the extent possible a break-down of the financing sources that are expected to meet the investment need (i.e. how much is expected to come from public versus private sources per type of decarbonisation/climate resilience investment, etc.).
- ✓ **Timeframe** – cumulative and average annual investment needs up to 2030 and 2050;
- ✓ **Type of model** – e.g. simulation, optimisation, partial market equilibrium;
- ✓ **Main assumptions used** – e.g. on CO_2 and GHG emissions reductions, targets;
- ✓ **Sectoral and geographical coverage** – any specifics on sectoral and geographical coverage – with the aim of looking at sectoral level projection / investment needs;
- ✓ **Scenarios** – what are the assumptions behind these estimates? For the scenarios up to 2030, we will take the EUCO30 scenario of PRIMES as the main scenario, with the EUCO27 scenario included, and compare with the IEA WEO 450 scenario. For the scenarios up to 2050, we will look into the scenarios behind the 2050 Roadmap as well as the IEA WEO 450 scenario.

An overview of the most relevant studies considered, their scope, as well as the bandwidth of resulting investment needs estimations is presented in sections 2.1.2 and 2.1.3 for mitigation and adaptation respectively.

2.1.2 Estimated investment needs for climate mitigation

As regards climate change mitigation, at the Paris climate conference (COP-21) in December 2015, 195 countries agreed to keep the increase in global average temperature to well below 2°C above pre-industrial levels, with the aim to limit it to 1.5°C.[29]

In parallel with this far-reaching international commitment, the European Union has published its latest updates to European targets and corresponding policy measures in the policy package accompanying the Communication 'Clean Energy for All Europeans' (COM(2016) 860 Final)[30]. With this new policy package the European Commission shows its firm commitment for the EU to take leadership in the clean energy transition. The EU remains committed to cut GHG emissions by at least 40 % by 2030 and to achieve three key goals:

1. putting energy efficiency first (the European Commission has now proposed to commit to achieving a binding target of at least 30 % energy efficiency by 2030[31]);
2. achieving global leadership in renewable energies (the EU has set itself a binding target to collectively reach a share of at least 27 % renewables in final energy consumption by 2030);
3. providing a fair deal for European consumers.

These targets follow on the 20/20/20 targets of the 'EU 2020 climate & energy package'. The corresponding long-term goal of the EU is to achieve 80-95 % emission reductions by 2050[32].

These key energy and climate targets for climate mitigation are summarised in Table 2-1

[29] UNFCCC (2015). Paris Agreement. http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf
[30] COM(2016) 860 Final. http://eur-lex.europa.eu/resource.html?uri=cellar:fa6ea15b-b7b0-11e6-9e3c-01aa75ed71a1.0001.02/DOC_1&format=PDF and for all related documentation, see http://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition
[31] Previously as part of the 2030 Climate and Energy Framework MS had included a compromise of a nonbinding 30% energy efficiency target by 2030.
[32] COM(2011) 112. A Roadmap for moving to a competitive low carbon economy in 2050

Table 2-1 Summary of key EU targets in the short, medium and long term

EU Level Target	2020	2030	2050	Baseline/explanatory notes
Greenhouse gas emissions[33]	20 %	40 %	80-95 % (Indicative)	Reduction compared to 1990 levels
Renewable Energy[34]	20 %	27 %	55 % (Indicative)	% of total energy consumption
Energy Efficiency	20 % (Not binding)	30 % (Not binding)	41 % (Indicative)	Reduction compared with BAU scenario
Electricity interconnection	10 %	15 % (Proposed)	No target yet	% of installed electricity production capacity
Smart Electricity Metering deployment	80 %	No target	No target	If national CBA leads to a positive result, roll-out of smart meters is mandatory for at least 80 % of households by 2020.

Source: *EC's 2020 Climate & Energy Package, EC's 2030 Climate and Energy Framework, 2050 Low-Carbon Economy*[35]*, Renewable Energy Directive*[36]*, Energy Efficiency Directive*[37]*, Clean Energy for All Europeans policy package*[38]*, 2050 Roadmap for Energy*[39]*, Third Energy Package*[40]

Given the urgent challenge to secure sufficient investment in order to meet these ambitious targets, numerous estimates have been made to size up the investment needs up to 2020, 2030 or 2050.

The use of different underlying policy scenarios, data sources, as well as definitions of what is included in the respective figures, however, make it difficult to compare the estimated investment needs figures across the different studies.

During the research and analysis, several major studies have been reviewed. Most of these studies stem from bodies such as the European Commission and the IEA/OECD, providing an independent and objective analysis of pathways to achieve a low-carbon economy. Due to the use of different scopes across the reports, the resulting investment needs estimates are – in essence – not comparable at face-value. To be able to make a meaningful assessment of the current state of play of estimated mitigation investment needs for the EU as a whole, only five key reports were selected and assessed in further detail (Table 2-2).

It should be noted that these are total investment needs, thus including all relevant investments that need to be made in the future, not only those that would be required in addition to the business-as-usual development.

[33] The national 2020 targets for the non ETS sectors (i.e. housing, agriculture, waste, small industrial installations and transport, excluding aviation) differ according to GDP per capita, e.g. from a 20 % cut for the richest countries to a maximum 20 % increase for the least wealthy for 2020. The target for the ETS sectors (large industrial and energy installations and aviation) is not split up per MS.
[34] The 2020 RES targets were determined per MS based on their starting point and their technical and economic potential. The 2020 target also includes a 10% RES share in the transport sector, which can be among other things, achieved with an increased use of electrical vehicles.
[35] COM (2011) 112: A Roadmap for moving to a competitive low carbon economy in 2050
[36] Directive 2009/28/EC on the promotion of the use of energy from renewable sources
[37] Directive 2012/27/EU on energy efficiency
[38] COM(2016) 860 Final. http://eur-lex.europa.eu/resource.html?uri=cellar:fa6ea15b-b7b0-11e6-9e3c-01aa75ed71a1.0001.02/DOC_1&format=PDF and for all related documentation, see http://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition.
[39] COM (2011) 885: Energy roadmap 2050
[40] Directive 2009/72/EC on internal electricity market

Table 2-2 Summary table of investment needs estimations provided by key relevant literature

Literature source	Sub-sectors covered	Scenarios	Timeframe	Cumulative investment needs in constant EUR'15[41]	Annual investment needs in constant EUR'15[42]
EC (2011), Energy Roadmap 2050	• Energy system capital cost • Energy system direct efficiency investment costs (split made for grid investments)	Reference	2011-2050	42 875 (39 320 bn EUR'08)	1 072 (983 bn EUR'08)
		High EE		61 499 (56 400 bn EUR'08)	1 537 (1 410 bn EUR'08)
		Diversified supply technologies		54 956 (50 400 bn EUR'08)	1 374 (1 260 bn EUR'08)
		High RES		54 651 (50 120 bn EUR'08)	1 366 (1 253 bn EUR'08)
		Low nuclear		55 174 (50 600 bn EUR'08)	1 379 (,265 bn EUR'08)
SWD (2014) 16, IA 2030	Energy system: • Generation & boilers • Grid • Industry • Residential & tertiary • Transport	Reference	2011-2030	17 559 (16 320 bn EUR'10)	878 (816 bn EUR'10)
			2031-2050	20 421 (18 980 bn EUR'10)	1 021 (949 bn EUR'10)
		GHG40/ EE/RES30	2011-2030	18 914 (17 580 bn EUR'10)	946 (879 bn EUR'10)
			2031-2050	28 683 (26 660 bn EUR'10)	1 434 (1 333 bn EUR'10)
		GHG45/ EE/RES35	2011-2030	19 560 (18 180 bn EUR'10)	978 (909 bn EUR'10)
			2031-2050	28 683 (26 660 bn EUR'10)	1 434 (1 333 bn EUR'10)
OECD/IEA (2014), World Energy Investment Outlook	• Energy supply (power+fuel) • End-use efficiency	NPS	2014-2035	5 133 (5 384 bn USD'12)	234 (245 bn USD'12)
		450 scenario		6 222 (6 526 bn USD'12)	283 (297 bn USD'12)
EIB (2016), Restoring EU competitiveness	Total energy sector • Energy efficiency savings in buildings and industry • Power generation, incl. RES Upgrading energy networks	Required investment needs [43]: **TOTAL**	2016-2030	3 712 (3 450 bn EUR'10)	247 (230 bn EUR'10)
		• Energy efficiency savings in buildings and industry		1 808 (1 680 bn EUR'10)	121 (112 bn EUR'10)
		• Upgrading energy networks		855 (795 bn EUR'10)	57 (53 bn EUR'10)

[41] Amounts in original unit have been converted to 2015 constant Euros using an online Eurozone inflation calculator (StatBureau.org), as well as http://www.westegg.com/inflation/infl.cgi combined with the World Bank's USD/EUR exchange rate for 2015 for the USD values.
[42] Amounts in original unit have been converted to 2015 constant Euros using an online Eurozone inflation calculator (StatBureau.org), as well as http://www.westegg.com/inflation/infl.cgi combined with the World Bank's USD/EUR exchange rate for 2015 for the USD values.
[43] EC estimates of average annual investment in EU28 over the period 2016 to 2030, supplemented on occasion by EIB estimates. The scenario assumes compliance with all existing EU legislation, plus adoption of a 40% GHG target by 2030.

Literature source	Sub-sectors covered	Scenarios	Timeframe	Cumulative investment needs in constant EUR'15[41]	Annual investment needs in constant EUR'15[42]
		• Power generation, incl. RES		759 (705 bn EUR'10)	51 (47 bn EUR'10)
SWD (2016) 405, **Impact Assessment related to** **'Clean Energy for All Europeans'[44] Policy package**	Energy system: • Generation & boilers • Grid • Industry • Households • Tertiary • Transport	Reference	2021-2030	9 448 (9 380 bn EUR'13)	944 (938 bn EUR'13)
		EUCO30		11 230 (11 150 bn EUR'13)	1 123 (1 115 bn EUR'13)
		EUCO+33		12 409 (12 320 bn EUR'13)	1 241 (1 232 bn EUR'13)
		EUCO+35		13 335 (13 240 bn EUR'13)	1 334 (1 324 bn EUR'13)
		EUCO+40		15 763 (15 650 bn EUR'13)	1 576 (1 565 bn EUR'13)

Source: *own elaboration based on mentioned reports*

[44] The impact assessment related to the proposed revisions of the Energy Efficiency Directive as well as the supporting material to the Energy Union progress report present the latest BAU scenario (REF2016) and corresponding policy scenarios achieving the set targets to varying degrees. EUCO30 is the scenario that best resembles the exact achievement of the 2030 climate and energy targets.

The main requirements for this selection were that the reports' estimates needed to be in line with the latest set targets at least up to 2030 (i.e. 27 % renewable energy share and 30 % energy savings)[45], taking a broad scope including at least (most) of the sectors relevant for mitigation. The other reports initially reviewed, but not taken into account for further analysis (due to not meeting these selection criteria) are listed in Table 2-3.

Table 2-3 Other relevant (but excluded) literature providing investment needs estimations

Source	Reason for exclusion
OECD/IEA and IRENA (2017), Perspectives for the energy transition – investment needs for a low-carbon energy system	Does not disaggregate the worldwide investment figures to regional sub-divisions.
OECD/IEA (2016), World Energy Outlook 2016	Does not include figures on investment needs for a low-carbon economy (the 450 scenario); only includes figures on the EU level for the new policies scenario, which is a reference scenario
OECD/IEA (2016), World Energy Investment Outlook	Only includes figures on the EU level of current (2015) investments
CE Delft (2016). Investment challenges of a transition to a low-carbon economy in Europe	In-depth analysis of the SWD (2014) impact assessment, no additional estimation of investment needs is presented
OECD/IEA (2015), WEO Special Report Energy and Climate Change	Includes only an INDC and a Bridge scenario on the EU level. The most relevant scenario to reach a low-carbon economy is (the 450 scenario) is more thoroughly discussed in OECD/IEA 2014
Barclays (2011), Financing the low carbon economy	Only includes power supply figures between 2011 and 2020
Ecofys et al (2010), Financing Renewable energy in the European Energy market	Only includes renewable energy between 2011 and 2020

Source: *own elaboration based on mentioned reports*

In general, studies often look at different pathways (i.e. scenarios) to reach the low-carbon economy. This can inform policy-makers on how different pathways towards the same broad policy goal can still imply that the associated total investment needs figures differ from one another. For example, if the pathway rejects nuclear energy, this needs to be substituted by other (possibly more expensive) technologies. This has consequences for the required investments to reach the decarbonisation targets. Some of the studies also explore more ambitious pathways reaching higher decarbonisation levels than required by the currently set targets. Therefore, the inclusion of different pathways to reach the low-carbon economy, results in a range of overall mitigation investment needs figures.

The five analysed documents show a large variety of pathways to reach the climate targets. Below, these different pathways with increasing ambition levels are presented. The reference scenarios are also discussed ('0' pathway), representing a business as usual situation. Most comparable between reports are the decarbonisation scenarios with the lowest level of ambition, numbered '1'. The difference between the decarbonisation pathways and the reference scenarios represents the remaining mitigation financing gap.

Estimates from the 2050 Energy Roadmap (2011)

The 2011 Energy Roadmap 2050 by the European Commission analysed four different decarbonisation pathways where at least the current RES targets were met:

0. Reference scenario (1 072 bn EUR'15 avg. annual investment need): this reference scenario includes current trends and long-term projections on economic development, rising fuel prices and policies implemented by March 2010. No further policies after 2020 are modelled.
1. High EE (1 537 bn EUR'15 avg. annual investment need): driven by political commitment of very high primary energy savings including a very stringent implementation of the Energy Efficiency plan.

[45] The presented figures were selected to only include scenarios complying to the EU climate targets of 27% RE, 30% EE and 40% GHG in 2030 (and 80% GHG cuts in 2050). For the SEC (2011) Energy Roadmap 2050 and the OECD/IEA (2014) World Energy Investment Outlook such scenario results are not given. Therefore, for these reports it remains unclear whether the investment needs estimates they present are sufficient to reach the current targets.

2. Diversified supply technologies (1 374 bn EUR'15 avg. annual investment need): a pathway where all energy sources can compete on a market basis, therefore displaying a significant penetration of CCS and nuclear energy.
3. High RES (1 366 bn EUR'15 avg. annual investment need): aims to achieve an overall higher RES share, very high RES penetration in power generation relying mainly on domestic supply.
4. Low nuclear (1 379 bn EUR'15 avg. annual investment need): similar to 'diversified supply technologies', but with a lack of public acceptance of nuclear energy.

The Energy Roadmap 2050[46] aims to reduce total EU GHG emissions in 2050 by 80 % - 95 % of the 1990 levels. This would require cutting emissions by 40 % in 2030 (already endorsed in 2014) and by 60 % in 2040. To achieve these ambitious targets, the power sector would have to almost totally eliminate its GHG emissions by 2050. The Energy Roadmap 2050 explores different pathways to achieve the 2050 target mentioned above, without jeopardising competitiveness or security of supply. The 2050 Roadmap confirms that the low-carbon goal is economically feasible, but highlights the need to mobilise investors and to offer a unified and effective approach to energy sector incentives, in particular a higher carbon price, support for early movers, greater and more tailored financing via public institutions (EIB, EBRD) and the mobilisation of the commercial banking sector and new institutional investors.

The decarbonisation scenarios require about 30 % more investments than the 'Current Policy Initiatives' (CPI) scenario, because increasingly more sophisticated infrastructure is needed. The High-RES scenario requires additional RES assets, DC lines and more storage. Considering the technology and market developments, investments in nuclear and CCS are expected to be limited, at least in the next two decades. The three technology scenarios (DST, delayed CCS and low nuclear) can hence be considered as a reasonable basis to estimate future investment needs.

Estimates from the 2030 Climate and Energy Framework (2014)

The SWD (2014) 16 Impact Assessment for the 2030 climate and energy framework distinguishes two scenarios where the targets are met: GHG40/EE/RES30 and GHG45/EE/RES35. The second scenario is basically more ambitious than the first scenario.

0. Reference scenario (878 bn EUR'15 avg. annual investment need): this reference scenario explores the consequences of current trends, including full implementation of policies adopted by late spring 2012.
1. GHG40/EE/RES30 (1 190 bn EUR'15 avg. annual investment need): this pathway is mainly driven by explicit ambitious energy efficiency policies and pre-set RES target (30 %) that ensure progress by addressing market imperfections and failures. CO2-price for both ETS and non-ETS sectors, but not main driver (lower ETS-price than in reference scenario).
2. GHG45/EE/RES35 (1 206 bn EUR'15 avg. annual investment need): this scenario has a high ambition in terms of GHG emission reduction. Driven by very ambitious energy efficiency policies and pre-set RES target (35 %). CO2-price for both ETS and non-ETS sectors, slightly higher than in scenario 1 up to 2030, but not main driver (lower ETS-price than in reference scenario).

The 2030 Climate and Energy Framework[47] was agreed in 2014. It builds on the 2020 package and sets three key targets for 2030. According to the EC's impact assessment for the 2030 climate and energy policy framework, the total investment needs in the Reference scenario amount to EUR 878 billion (annual average for 2011-2030) and the decarbonisation scenarios require additional investments ranging from 7.71 % (for a 40 % GHG reduction target and 30 % RES) to 11.4 % (for a 40 % GHG reduction target and 35 % RES) compared to the Reference scenario[48]. The incremental investment needs to reach the 2030 targets are hence relatively low; the average electricity cost in 2030 would be basically identical in the considered scenarios, i.e. 176 EUR/MWh in the Reference scenario and 179 EUR/MWh and 178 EUR/MWh respectively in the two other scenarios versus 131 EUR/MWh in 2010.

[46] COM (2011) 112: A Roadmap for moving to a competitive low carbon economy in 2050
[47] COM (2014) 15: A policy framework for climate and energy in the period from 2020 to 2030
[48] SWD (2014)16: Executive summary of the impact assessment fort the policy framework for climate and energy in the period from 2020 to 2030

Estimates from the OECD/IEA World Energy Investment Outlook (2014)

The OECD/IEA's World Energy Investment Outlook 2014 only explored one pathway besides a reference scenario. This pathway takes into account reaching the climate targets.

0. Reference scenario (234 bn EUR'15 avg. annual investment need): this scenario is commonly referred to as the New Policies Scenario. This takes into account broad policy plans and commitments that have been announced by the Member States.
1. 450 scenario: for this scenario a pathway is set out which is consistent with a 2°C temperature rise by limiting the concentration of GHGs to 450 parts per million of CO_2.

Estimates from the EIB Restoring Europe's competitiveness report (2016)

The European Investment Bank's report considers current spending levels (as a reference) and compares these to one pathway of required future investment needs up to 2030. This path

0. EIB reference – current spending: The reference baseline provided in the report is based on EC estimates of average annual investment in EU28 over the period 2001 to 2015, supplemented on occasion by EIB estimates.
1. EIB required investment (247 bn EUR'15 avg. annual investment need): This is based on EC estimates of average annual investment in EU28 over the period 2016 to 2030 (using 2014 Impact Assessment scenarios), supplemented on occasion by EIB estimates. The scenario assumes compliance with all existing EU legislation, plus adoption of a 40 % GHG target by 2030. However, while the Commission's plans foresee implementation until 2020, the EIB's analysis assumes that the required investments are only completed by 2030.

Estimates from the Impact Assessments of the EED and RED (2016)

The European Commission's 2016 Impact Assessment considers five different pathways, all taking into account the 2030 targets[49]. However, as in 2015 the EU parliament called for three binding energy and climate targets for 2030, the '+' scenarios consider more ambitious scenarios anticipating unforeseen changes.

0. Reference scenario (944 bn EUR'15 avg. annual investment need): assumes no new policies beyond those adopted by the end of 2014 and adheres to binding 2020 targets.
1. EUCO30 (1 123 bn EUR'15 avg. annual investment need): policy pathway with 30 % reduction of primary energy consumption, the current minimum energy efficiency ambition level.
2. EUCO +33 (1 241 bn EUR'15 avg. annual investment need): policy pathway with 33 % reduction of primary energy consumption and higher RES shares
3. EUCO+35 (1 334 bn EUR'15 avg. annual investment need): policy pathway with 35 % reduction of primary energy consumption and higher RES shares
4. EUCO+40 (1 576 bn EUR'15 avg. annual investment need): policy pathway with 40 % reduction of primary energy consumption and higher RES shares

Comparison of estimates

A comparison of the approaches used in the above studies is provided in Appendix 1.

Time horizons

While the annualized or cumulative investment needs present an average, the timing of the investment will also impact on the outcome (see, for example, Table 2-4). According to OECD, 60 % of greenhouse gas emissions are hard-wired in infrastructure[50], so the next 15 years are crucial for achieving 2C by 2100.

[49] It should be noted that we have not presented the EUCO27 scenario here as it would not achieve the latest agreed EE ambition of 30%.
[50] http://www.oecd.org/env/investing-in-climate-investing-in-growth-9789264273528-en.htm

Table 2-4 Typical lifespans of selected infrastructure and equipment

	Lifespan
Water infrastructure (dams, reservoirs, sanitation facilities)	30-200 yr
Transportation (port, bridges)	30-200 yr
Buildings, housing (insulation, windows, buildings)	30-150 yr
Power plants (coal-fired, gas-fired, nuclear)	20-60 yr
Cars	15-20 yr
Building appliances	10-20 yr
Industrial boiler	10-30 yr
Cities, urbanisms, land use planning	> 100 yr

Source: Corfee-Morlot et al. (2012).

***Source**: OECD 2017 Investing in Climate, Investing in Growth*[51]

At the same time, the incremental capital cost of shifting investments for the IEA 66 % 2°C scenario would be offset by fuel savings; factoring in modal shifts in transport and provided that low-emission infrastructure investment is pursued in an integrated way with climate-consistent, growth-enhancing policies, it could form an integral part of a new growth model for low-carbon growth, offsetting incremental costs entirely (OECD 2017[52]).

The economic rationale of a rapid transition has been identified in many analyses (see, for example, Figure 2-1).

Figure 2-1 Macro-economic implications of delaying action on climate (without growth-enhancing policies), GDP difference to 50 % 2C scenario

***Source**: 2017 OECD*[53]

Governments have a key role to play in setting market rules, incentives and standards to guide infrastructure choices toward sustainable outcomes. That also includes removing incentives for unsustainable activities, notably subsidies to fossil fuels (see Table 2-5).

[51] Page 106
http://www.oecd.org/environment/investing-in-climate-investing-in-growth-9789264273528-en.htm
[52] idem Page 102; figure 3.6
[53] Page 148; OECD 2017 "investing in climate, investing in growth"
http://www.oecd.org/environment/investing-in-climate-investing-in-growth-9789264273528-en.htm

Table 2-5 Government support to fossil fuels in G20 countries, in USD billions

	2012	2013	2014
Production	28	21	18
Consumption	398	380	354
Of which, market transfers to consumers	*247*	*236*	*213*
Of which, other transfers (direct payments and tax preferences)	151	144	141
General Services	4	6	4

Note: 1. Including subsidies related to the under-pricing of electricity.
Sources: IEA (2015) and OECD (2015d).

***Source**: 2017 OECD*[54]

2.1.3 Conclusions: estimated mitigation investment needs in Europe

The detailed descriptions and discussion of the most relevant reports on estimated mitigation investment needs in Europe provide the broader context within which to view the contributions of the EU's budget. Prior to delving into a discussion and assessment of the potential contribution of public spending, and the EU's budget in particular, towards these overall climate-related investment levels, it is crucial to highlight once more that the estimated investment needs that have been presented throughout section 2.1.2 represent overall total estimated mitigation investment needs. This means that they include all relevant investments (e.g. replacement and/or updating of old infrastructure) that need to be made in the upcoming future, not only those that would be required in addition to the business-as-usual development.

Estimated overall investment needs are often confused with what can be called the 'remaining financing gap', or incremental costs. The remaining financing gap, however, is in essence the difference between the 'business-as-usual' scenario (assuming all currently adopted policies continue, but no additional efforts are taken) and the scenario that best resembles achievement of the set policy targets. This difference between the two pathways is the amount of finance that is needed 'on top of / in addition to' the level of climate action finance that would 'happen anyway' under the business-as-usual scenario. The following table illustrates these differences for the 2016 Impact Assessment.

The below table presents (a) the overall estimated investment needs up to 2030 based on a business-as-usual pathway (REF2016 scenario), (b) the total investment needs based on achieving the EU's energy and climate targets (EUCO30 scenario), and (c) the remaining mitigation financing gap in Europe (i.e. the difference between EUCO30 and REF2016 scenario results). It should be noted here that the REF2016 scenario is assumed to include all the planned and future anticipated public and private investments that are assumed to occur based on historic spending levels. As such, the difference between the REF2016 and EUCO30 scenarios represents the remaining financing gap for European domestic climate finance.

[54] Idem, page 196

Table 2-6 Remaining financing gap for achieving the 2030 EU climate and energy targets (in bn EUR'15[55])

		Investment needs under BAU conditions continued until 2030	Total investment needs for achieving the EU's 2030 climate and energy targets	Remaining financing gap for European domestic mitigation finance
	Associated scenario / Sector	REF2016[56]	EUCO30	EUCO30-REF2016
Cumulative investment needs and remaining financing gap, 2021-2030		9 448	11 230	**1 782**
(Average) annual investment needs and associated remaining financing gap		944	1 123	**178**
Sectoral decomposition of (average) annual investment needs and remaining financing gap				
Demand side[57]	*Industry*	15	19	***4***
	Buildings – households	128	216	***88***
	Buildings – tertiary sector	23	68	***45***
	Transport[58]	710	741	***31***
Supply side[59]	*Grid*	*34*	36	***2***
	Power generation – Renewables	*25*	34	***9***
	Power generation - Conventional	*8*	8	***0***

Source: own development based on SWD (2016) 405, Impact Assessment on Energy Efficiency accompanying the EC Communication 'Clean Energy for All Europeans', Table 22 (p.66).

2.1.4 Estimated investment needs for climate adaptation

The costs of climate and weather related natural disasters in recent years have increased. Weather and climate related damages in Europe between 1980 and 2013 were almost EUR 400 billion (EUR 393 billion, adjusted for inflation, in 2013 Euro values), on average EUR 11.6 billion per year, EUR 69 000 per square kilometre, or EUR 710 per capita (based on average population over the entire period 1980-2013).[60] Only around 33 % of the total losses were insured. Flooding, along with wind-related storms, is the most important natural hazard facing Europe.[6162] A recent study by Jongman et

[55] Amounts in original (2013) Euros have been converted to 2015 constant Euros using an online Eurozone inflation calculator (StatBureau.org).
[56] Whereas the EUCO scenario achieves the 2030 targets for RES (≥27%), GHG (≥ 40%) and energy efficiency ((≥30%), the REF2016 does not achieve these targets.
[57] Investments on the demand side include energy equipment (covering appliances in households and tertiary sector, vehicles, industrial equipment etc.) and direct energy efficiency investments (covering renovation of buildings improving their thermal integrity).
[58] The high numbers for transport are due to the fact that this includes investments in transport equipment for mobility purposes (e.g. rolling stock but not infrastructure) and energy efficiency. They exclude investments in recharging infrastructure. However, the largest part of the additional investment needs (last column) between current versus needed investment levels for the transport sector can largely be attributed to clean energy investment needs.
[59] Investments on the supply side (power generation) include grids as well as power generation (power generation plants and industrial boilers).
60 Munich RE, 2014, 'NatCatService Database' (www.munichre.com/natcatservice). As a proprietary database, it is not publicly accessible. The period 1980-2013 is the entire Munich Re (MR) dataset provided to the European Environment Agency under institutional agreement (June 2014).
61 ESPON (2013). "Natural hazards and climate change in European regions", Territorial Observation no. 7, European Union ESPON, May 2013
[62] EEA (2017). "Climate change, impacts and vulnerability in Europe 2016 – An indicator-based report", EEA Report, No 1/2017, European Environment Agency, January 2017

al (2014)[63] suggests that annual average economic losses caused by extreme floods could reach almost five times higher than 2013 values. Another recent study by The Economist Intelligence Unit (2015) concluded that the value at risk due to climate change (permanent impairments to total assets) will increase significantly from 2050 onwards to a level of USD 13.9 trillion (from a government perspective) globally, or 10 % of current total assets, by 2100.[64] An important consideration for investors in assessing their climate-related financial risk are the time horizons in which certain climate risks are happening and/or anticipated, which has been researched in more details recently by CICERO Climate Finance (2017).[65] Overall, these trends and findings emphasise the urgency for action also on the issue of adaptation to climate change within Europe.

The **EU Adaptation Strategy**[66], published in April 2013, is the main policy guidance document on European level aiming to deliver various climate adaptation related objectives. The Strategy is a powerful response to the climate hazards Europe is and will increasingly be facing. It demonstrates a dedicated long-term commitment to increase the resilience of the EU territory by enhancing the preparedness and capacity of all government levels to respond to the impacts of climate change. The EU Adaptation Strategy commits to delivering 3 Objectives, through the implementation of 8 Actions. These Objectives, and the associated Actions, are summarised in the table below. The Strategy also has a strong focus on sector[67] aspects as well as actions taken at different levels (e.g. international, EU, national and sub-national action). Currently, a first evaluation of the EU Adaptation Strategy is carried out by the Commission services[68] which includes analysis on the efficiency of each of the Actions described in the Strategy.

Table 2-7 Summarised overview of the key Objectives and Actions in the EU Adaptation Strategy

Objectives	Actions
Promoting action by Member States	1: Encourage all Member States to adopt comprehensive **adaptation strategies** 2: Provide **LIFE funding** to support capacity building and step up adaptation action in Europe. (2013-2020). 3: Introduce adaptation in the **Covenant of Mayors** framework (2013/2014).
Better informed decision-making	4: Bridge the **knowledge gap**. 5: Further develop **Climate-ADAPT** as the 'one-stop shop' for adaptation information in Europe
Climate-proofing EU action: promoting adaptation in key vulnerable sectors	6: Facilitate the **climate-proofing** of the Common Agricultural Policy (CAP), the Cohesion Policy and the Common Fisheries Policy (CFP). 7: Ensuring more **resilient infrastructure** 8: Promote insurance and other **financial products for resilient investment** and business decisions

In contrast to the mitigation challenge, however, the EU Adaptation Strategy does not provide specific nor quantified targets to work towards. The lack of such well-defined targets makes any attempt at a quantified assessment related to the Strategy very challenging.

In addition to the lack of a detailed target, the availability of estimations regarding the required investment needs associated with a successful transition to a climate-resilient Europe, as well as data and information on the climate-related financial risks of different asset levels and classification[69], is

63 Jongman, B., Hochrainer-Stigler, S., Feyen, L, 2014, 'Increasing stress on disaster-risk finance due to large floods'. Nature Climate Change 4, 264–268.
64 EIU (2015). « The cost of inaction: recognising the value at risk from climate change », a report from The Economist Intelligence Unit Limited (EIU).
65 CICERO (2017). « Shades of Climate Risk – Categorizing climate risk for investors », a report by CICERO Climate Finance Center for the Norwegian Ministry of Foreign Affairs, February 2017.
66 http://ec.europa.eu/clima/policies/adaptation/what/documentation_en.htm
67 The Strategy makes explicit reference to the following sectors: Agriculture, Forestry, Biodiversity, Coastal areas, Disaster risk reduction, Financial, Buildings, Energy, Transport, Health, Water management, Marine and fisheries.
68 http://ec.europa.eu/smart-regulation/roadmaps/docs/2016_clima_011_evaluation_adaptation_strategy_en.pdf
69 2Dii (2017). "Asset-level data and climate-related financial analysis: a market survey", a report produced by 2 Degrees Investing Initiative (2Dii) with support from the European Commission and ADEME, January 2017.

very scarce. Partially this lack of estimations can be related back to the large uncertainties associated with adaptation to climate change and consequently the associated costs.

Those estimates that do exist are often **incomplete**. According to the ECONADAPT[70] research project, which carried out an in-depth analysis of available adaptation literature, adaptation investment needs are also often **underestimated**.

Due to these inherent issues researchers are hesitant to present specific ranges of estimated adaptation finance needs. Additionally, often the objective of having such EU-wide estimates is not recognized as a necessity (such as is the case for mitigation), because climate adaptation is happening primarily on the local level and is very differentiated across a wide spectrum of possible measures, etc.[71]. Generally speaking, there is a better availability of global level estimates of investment needs for adaptation, or with a specific focus on developing countries. Additionally, other financial aspects of adaptation, such as (avoided) damage costs and operational costs are better covered across the literature than estimated investment needs. Here we highlight seven key studies[72], providing investment needs estimates required in Europe as a whole to adapt to the impacts of climate change. This selection of reports was done on the basis of comprehensiveness and date of publication. However, as mentioned above the availability of adaptation needs for Europe is not abundant. None of these studies give a full picture covering estimates for all identified adaptation categories (infrastructure, coastal zones, water supply and flood protection, agriculture, forestry & fisheries, human health, natural ecosystems and extreme weather events). Moreover, UNFCCC (2007) is a relatively old study, criticized as well[73], but it is the earliest and most widely-cited reports, covering a comprehensive analysis of adaptation investment needs.[74]

The key documents selected here on estimated adaptation investment needs for the EU as a whole are especially difficult to compare as they cover different areas of adaptation; total estimates giving an overview of all types of adaptation needs lack. Besides, the studies make use of different models, different timeframes, cover different geographical areas and explore different future pathways – however, they all make use of to the IPCC SRES scenarios. As a result of the differences in scope the seven key studies offer a range of required investment needs estimations (see Table 2-8).

With regard to the reported figures in these seven key studies, Markandya & Chiabai (2009) presented the lowest investment need, between 12-260 mn USD'00 annually between 2000 and 2030. These would however only cover adaptation measures in the human health in terms of diarrheal diseases, which is a small coverage of adaptation. Moreover, the timeframe is relatively rather short. De Bruin et al. (2009) on the other hand present annual investment needs between 155 and 509 bn USD. The use of an exceptionally large timeframe (2025-2185) partly explains this height, as investment needs in general increase with time (when more climate change impacts are expected). Additionally, de Bruin et al. use a much broader scope, covering all sectors as available at Impact Assessment models. The

[70] ECONADAPT (2015), ECONADAPT Policy Report 1: The Costs and Benefits of Adaptation

[71] When speaking about climate change mitigation, on the other hand, action/or non-action in one Member State can affect the air quality and emissions in another country as well.

[72] (1) UNFCCC (2007), Investment and financial flows to address climate change; (2) ClimateCost (2011), The impacts and economic costs of climate change in Europe and the costs and benefits of adaptation; (3) Bruin, de et al. (2009), Economic Aspects of Adaptation to Climate Change: Integrated Assessment Modelling of Adaptation Costs and Benefits, OECD; (4) Markandya, A. & Chiabai, A. (2009), Valuing Climate Change Impacts on Human Health: Empirical Evidence from the Literature; (5) Ciscar et al. (2014), Climate Impacts in Europe. The JRC PESETA II Project; (6) Forzieri et al. (2016), Resilience of large investments and critical infrastructures in Europe to climate change; and (7) BASE (2016), EU-wide economic evaluation of adaptation to Climate change.

[73] Parry et al. (2009), Assessing the costs of Adaptation to climate change. A review of the UNFCCC and other recent estimates. International Institute for Environment and Development and Grantham Institute for Climate Change, London.

[74] Other reports which were amongst those reviewed, but are not further presented in this report, are:

- World Bank (2010), The economics of adaptation to climate change: Very comprehensive EACC study, therefore often quoted. However, it considers climate finance for developing countries in the ECA region (Europe & Central Asia), which therefore only partly overlaps our focus on EEA countries.
- Agrawala et al. (2010), Plan or React? Analysis of adaptation costs and benefits using integrated assessment models: Uses a similar approach as Bruin et al. (2009) with IAMs. Does not report exact estimates, but reports investments only as % of GDP.
- Ciscar et al. (2011), Physical and economic consequences of climate change in Europe. Considers costs of not adapting, instead of investment needs to guard against the possible consequences of climate change.[74]
- UNEP (2015), Adaptation finance gap report: This report focuses only on developing countries (globally), where the adaptation capacity is often lowest and the needs are the highest.
- BASE adaptation (2016) FP7 project: Provides only global estimated investment needs.
- New Climate Economy (2016), The sustainable infrastructure imperative: Financing for Better Growth and Development: Only global coverage.

Appendix discusses more closely the methodological difference between the seven key documents and how they influence investment needs for adaptation.

Table 2-8 EU-wide adaptation investment needs according to seven key literature sources

Source	Geography	Scenario	Time horizon	Cumulative investments	Average annual investments	Unit	Coverage
UNFCCC (2007), Investment and financial flows to address climate change	OECD Europe	A1B	in 2030	-	26.8-39.6	bn USD	Water supply, coastal zones (also maximum in 2080) and infrastructure
		B1*		-	7.9-10.9		
ClimateCost (2011), The impacts and economic costs of climate change in Europe and the costs and benefits of adaptation	EU27	A1B	2011-2040 2041-2070 2071-2100	198 525 858	6.6 17.5 28.6	bn EUR**	Sea level rise, river floods and energy (new air conditioning)
		E1		192 351 498	6.4 11.7 16.6		
De Bruin et al. (2009), Economic aspects of adaptation to climate change	Western Europe	Base model	2025-2185	25	0.155	tn USD	All IA sectors: agriculture, other vulnerable markets, coastal, health, non-market time use, catastrophic events and settlements (no split)
		Higher damages		82	0.509		
Markandya & Chiabai (2009), Valuing climate change impacts on human health: empirical evidence from the literature	Europe (incl. CIS)	S550	2000-2030	372-6 355	12-205	mn USD'00	Human health (diarrheal diseases)
		S750		372-6 727	12-217		
		UE		372-8 060	12-260		
Ciscar et al. (2014), Climate Impacts in Europe. The JRC PESETA II Project	EU27	A1B ensemble simulation	2011-2040 2041-2070 2071-2100	193 ~30 193 ~60 193 ~75	1 2 2.5	bn EUR'05	Coastal impacts (dike building and beach nourishments; no split), including O&M costs
Forzieri et al. (2016), Resilience of large investments and critical infrastructures in Europe to climate change	EU+	A1B short	2011-2040	12	0.4	bn EUR	Critical infrastructures
		A1B medium	2011-2070	54	0.9		
		A1B long	2011-2100	138	1.5		
BASE (2016), EU-wide economic evaluation of adaptation to Climate change	~Europe	Range of two climate and three socio-economic scenarios	in 2050	-	32-56	bn USD'05	Floods, agriculture and health

* For infrastructure, the lower-bound scenario was based on Munich RE data, inherently different from the B1 scenario.

** *Investments are given here in constant 2005, 2006 and 2010 prices respectively for the areas sea-level rise, river floods and energy.*

With the growing demand for knowledge, different initiatives have been established to build the knowledge base, like CLIMATE-ADAPT, the European Climate Adaptation Platform. A recent study under the ECONADAPT (FP7) research project, has carried out a very elaborate literature review on economic analyses of climate change adaptation. In their extensive database[75] detailed reports can be found covering cost estimates for all different adaptation areas. Considering overall European-wide estimates similar studies were cited here as presented in Table 2-1. Considering the overall knowledge availability, they conclude that the knowledge base moved beyond the focus of coastal zones to water management, floods, agriculture and the built environment. The areas ecosystems or even business, services and industry still lag behind. However, even ECONADAPT's broad literature review across all adaptation-relevant fields did not deliver additional investment needs estimations on a comprehensive European scale (i.e. aggregated numbers).

Comparison of estimates

A more in-depth comparison of the approaches used in the above studies is provided in Appendix 1.

2.1.5 Conclusions: estimated adaptation investment needs

In summary, contrary to the mitigation challenge, there are currently no investment needs estimations on the adaptation challenge that best reflect the total, comprehensive (across all adaptation-relevant action areas and sectors) investment needs for Europe. The estimations that do exist cover rather different scopes and underlying assumptions. As a very rough indication, the following table summarises the estimated adaptation investment needs that best capture the various adaptation areas, European scope and relevant timeframe. The large range between the two studies can partially be attributed to the difference in the amount of adaptation-relevant sectors covered.

Table 2-9 Attempting to define an order of magnitude range for European adaptation investment needs

Source	Geography	Coverage	Unit	Estimated annual investment needs range
BASE study (2016)	~EU-28[76]	Floods, agriculture and health	Bn EUR'15	35-62
De Bruin et al. (2009)	Western Europe only	Agriculture, other vulnerable markets, coastal, health, non-market time use, catastrophic events and settlements (no split)		158-518

Source: based on estimations from De Bruin (2009) and BASE study (2016)
Figures differ from original unit values as provided in Table 2-8, here converted to 2015 constant Euros using an online Inflation Calculator (Westegg.com) and OECD exchange rates: https://data.oecd.org/conversion/exchange-rates.htm

Since these sources suggest a very broad range of anywhere between 35bn EUR'15 up to more than 500bn EUR'15 and because there is no availability of reference scenarios as is the case for the mitigation field, it is currently impossible to establish a remaining financing gap for adaptation. However, what is clear from the analysis is that despite the many knowledge gaps and uncertainties involved, there is an urgent need for continued and up-scaled investment in climate adaptation across Europe, as well as the need for better risk models to make the economic case for adaptation.

[75] Available on: http://econadapt-toolbox.eu/
[76] The 2016 BASE project uses a different geographical scope for each adaptation category, which mostly reflects a coverage of the EU28.

2.2 Potential contribution of the EU budget towards the overall investment levels

2.2.1 Methodology

In this next step, we describe the potential contribution of the EU budget towards the overall investment needs levels as described above. Given the large uncertainties surrounding the quantitative estimates of the current actual spending data, we describe this contribution in qualitative terms, supported with quantitative data in case available and sufficiently robust.

We characterise the role of the EU budget at a sector level in the of Member States' public spending and private investment. The starting point for the assessment is the current (or recent) 2014-2016 contribution of the EU budget towards the current investment level as provided by the REF2016 scenario for mitigation only (not available for adaptation). This tells us what contribution the EU budget is currently making towards the current investment levels, as well as information on the funding (including that leveraged by EU spending) from other sources.

This estimate of the current contribution of the EU Budget can also provide a benchmark for what future EU budget spending needs to be in order for the EU climate and energy target to be met (i.e. assuming a similar proportion of funding needs to be provided from public sources). In practice, it might be expected that the proportional contribution of the EU budget to total investment may not need to be as high in the future as a result of more effective use of public funds (e.g. through innovative instruments, and those with higher leverage ratios); however, there may also be some countervailing pressures, including the need for public-sector led, or highly subsidised, investment in new and unproven areas of climate mitigation.

To illustrate findings in a bit more detail, a case study box (see Box-1 below) has been added highlighting the different sources of finance that are contributing to total climate finance levels in Germany, France and Belgium.

As a next step, key barriers and drivers to climate investment – or so-called influencing factors – are briefly explained. In combination with the high-level analysis of the EU Budget in relation to overall investment needs, a narrative around the role that the EU budget has had in the delivery of EU energy and climate target to date and the potential contribution going forward is presented. This highlights a potential prioritisation of the EU Budget towards specific mitigation action areas that are most suitable for EU support, e.g. less likely to be picked up by private finance, large investment gap, etc.

2.2.2 Results

The team's review and assessment efforts have focused on locating and collating the most accurate data available to help shed light on the question of the EU Budget contribution both to current climate-relevant spending levels, as well as to how much the EU Budget is likely to contribute to overall estimated climate-related investment needs in the future.

2.2.2.1 Estimating an EU Budget disaggregation to allow for comparative analysis

Similar to the analysis carried out in Section 2.1, it is more logical to disaggregate the assessment along the two climate-related challenges of mitigation and adaptation. Such disaggregation in the analysis is necessary as identified investment needs, typical sources of finance and relevant climate action sectors differ quite significantly. Additionally, more quantitative data is available regarding mitigation finance, whereas much of the issues related to adaptation finance need to be discussed in a qualitative way.

The only major issue with this type of approach is the fact that EU Budget data is currently not disaggregated in this manner. None of the reporting of climate-relevancy across programmes requires data on this split. Therefore, in order to still enable a meaningful discussion and analysis, we have made the disaggregation between mitigation and adaptation funding based on expert judgment. It should be noted however, that we have made an expert judgement of the proportion of climate-marked expenditure which is relevant to climate adaptation or to climate mitigation. These should not be taken as estimates of the total adaptation-relevant expenditure and the total mitigation-relevant expenditure respectively, since funds or projects may be able to contribute to both adaptation and mitigation, i.e. have co-benefits.

Table 2-10 EU Budget split between mitigation and adaptation based on expert judgment

2014-2020 PERIOD	EUR bn		EUR bn		EUR bn		
EU BUDGET	Total	% of total	Adaptation	Coefficient	Mitigation	Coefficient	Justification
H2020	**17**	8 %	**2.55**	*0.15*	**14.45**	*0.85*	No known information to disaggregate the amount. Disaggregation based on an assessment of the main H2020 headings (data taken from H2020 fiche)
CF + ERDF	**55**	27 %	**5.5**	*0.10*	**49.5**	*0.90*	No known information to split the amount. Disaggregation based on rough share of TO 4 (mitigation focussed) v TO 5 (adaptation focused).
ESF	**1**	0 %	**0**	*0.00*	**1**	*1.00*	No known information to split the amount. Based on initial review of ESF, this indicates it should be entirely mitigation-relevant finance.
EAGF	**47**	23 %	**11.75**	*0.25*	**35.25**	*0.75*	19.6 % of EAGF is identified as climate-relevant by the European Commission. This is made up of 10 % from permanent grassland (mitigation measure), 4 % from ecological focus areas (assumed 50/50 mitigation/adaptation), and 5.6 % from cross-compliance (assumed 50/50 mitigation/adaptation). This results roughly in a 25 %/75 % disaggregation.
EAFRD	**57**	28 %	**52**	*0.90*	**5**	*0.10*	No known information to split the amount. Based on initial review of EAFRD, this suggests a very high relevance for adaptation (land use, agri-environment-climate measures) and only a small amount of mitigation relevant measures. Therefore, assumed a 90/10 split.
EMFF	**1**	0 %	**0**	*0.00*	**1**	*1.00*	No known information to split the amount. Based on initial review of EMFF, this indicates it should be entirely mitigation-relevant finance.
LIFE	**2**	1 %	**0.8**	*0.40*	**1.2**	*0.60*	LIFE climate is evenly split between mitigation and adaptation in 2017, according to the European Commission website; but the draft budget for 2018 shows a shift towards mitigation. Climate contributions from the LIFE environment side appear to be evenly split between adaptation and mitigation.

2014-2020 PERIOD	EUR bn		EUR bn		EUR bn		
EU BUDGET	Total	% of total	Adaptation	Coefficient	Mitigation	Coefficient	Justification
Other	**21**	10 %	**10.5**	*0.50*	**10.5**	*0.50*	No known information to split the amount. Assumed 50/50 split due to lack of more detailed indications.
TOTAL	**201**		**82.4**		**118.6**		
%			**41 %**		**59 %**		

***Source**: based on current EU climate-relevant budget and expert judgment for the disaggregation*

The EU Budget disaggregation estimations presented in the table above lead to the following EU Budget disaggregation and relative shares for the current 2014-2020 MFF programming period.

Table 2-11 EU Budget 2014-2020 overview of total, climate-relevant, mitigation and adaptation shares (in EUR Bn)

	Current				Planned				
EU BUDGET PER MFF YEAR	2014	2015	2016	Avg. annual	2017	2018	2019	2020	Avg annual
EU budget total (EUR bn) [77]	118	159	151	143	154	157	160	164	159
Climate-relevant part of EU Budget (EUR bn) [78]	16	28	32	25	30	31	32	32	31
Mitigation total (EUR bn)	**9**	**17**	**19**	**15**	**18**	**18**	**19**	**19**	**18**
Mitigation as share of total EU Budget	8 %	11 %	13 %		11 %	12 %	12 %	12 %	
Mitigation as share of climate-relevant EU Budget[79]	59 %	59 %	59 %		59 %	59 %	59 %	59 %	
Adaptation total (EUR bn)	**7**	**11**	**13**	**10**	**12**	**13**	**13**	**13**	**13**
Adaptation as share of total EU Budget	6 %	7 %	9 %		8 %	8 %	8 %	8 %	
Adaptation as share of climate-relevant EU Budget[80]	41 %	41 %	41 %		41 %	41 %	41 %	41 %	

Source: Based on EU Budget 2014-2020 as presented in the MFF Mid-Term Review (SWD(2016) 299 final)

[77] Data provided in this line is taken from the EU Budget 2014-2020 as presented in the MFF Mid-Term Review (SWD(2016) 299 final).
[78] Data provided in this line is taken from the European Court of .Auditors, special report no. 31: Spending at least one euro in every five from the EU budget on climate action: ambitious work underway, but at serious risk of falling short.
[79] This ratio between mitigation and adaptation expenditure has been derived based on the information provided in Table 2-8.
[80] This ratio between mitigation and adaptation expenditure has been derived based on the information provided in Table 2-8.

Having derived this estimated EU Budget disaggregation, it is now possible to assess the relative contribution of the EU Budget towards overall investment needs levels for mitigation and adaptation activities.

2.2.2.2 The contribution of the EU Budget in mitigation finance

Before delving into the contribution of the EU Budget in overall European mitigation finance, it would be interesting to first get a better understanding of the more general split between public versus private sources, and then between public-European versus public-National sources. However, as reviewed in detail during the European Environment Agency study on 'The State-of-Play on Climate Finance Tracking In Europe' (publication expected early June 2017), the currently available data does not allow for such type of split analysis across different financing sources. Nevertheless, we have taken a very rough approximation using the public/private split for mitigation finance (no adaptation finance included!) encountered for the three existing domestic climate finance landscapes (DE, FR, BE).[81] From these national reports it is possible to derive a range as a rough estimation for the European level, i.e. roughly between 50-65 % private sector contributions and 35-50 % public sector contributions. It should be noted that this is only a very rough estimation for a European average range based on detailed analyses of the three MS mentioned previously. While the figures may not be accurate, one can conclude that at least half of all climate finance in Europe comes from private sources. Ideally, we could then also deduct the split between European versus national public funding; however, the current EU Budget is not disaggregated between mitigation and adaptation spending and therefore does not allow for such an exercise. If, however, we work with the assumed disaggregation presented here in this analysis for a moment, the EU's current ca. EUR 15bn mitigation budget would account for approximately 16-23 % of total public average annual mitigation spending (see table below). This means that most of public mitigation spending (i.e. the other ca. 77-84 % amounting to an annual average of EUR 51.5-80bn) is currently provided by public sources beyond the EU Budget, primarily from national public financing sources across Member States. At the same time, for several Member States, EU budget is the main source of public investment[82].

Table 2-12 Private versus public share in average annual mitigation spending

Average annual mitigation spending in Europe (2011-2015)[83]	Current average EU mitigation spending (2014-2016)[84]	Estimated range of public spending share	Estimated range of private spending share
190bn	15bn (or 16-23 % of total public share)	35-50 % (or 66.5 – 95bn)	50-65 % (or 95 – 123.5bn)

***Source**: own development*

As a next step, the following table shows the initial calculations regarding the EU Budget contribution to both current as well as future annual mitigation investment needs. As can be seen from the figures, the contribution from the EU Budget could support total mitigation finance needs by covering approximately 5-7 % of total required investment levels. This emphasises that most of the needed finance actually would need to stem from Member State public financial sources, as well as from private sources of finance.

[81] The three existing MS climate finance landscapes indicate the following estimated split between public and private sources of finance: DE (47% public, 53% private), FR (38% public, 62% private), BE (34% public, 66% private).
[8282] See page 8 of COM(2017) 358, Reflection paper on the future of EU finances. Available at: https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf
[83] European Parliament (2017). European Energy Industry Investments. Historic trends in actual spending for various periods as underlying Figure 8 on p. 35. http://www.europarl.europa.eu/RegData/etudes/STUD/2017/595356/IPOL_STU(2017)595356_EN.pdf
[84] See Table 2-11 above

Table 2-13 The EU budget contribution to the estimated EU mitigation investment needs (in bn EUR'15)

In constant Bn EUR'15	*Estimated avg. annual mitigation spending baseline for Europe up to 2030 (Excl. Transport) (REF2016)*	*Estimated avg. annual mitigation investment needs for Europe up to 2030 (Excl. Transport) (EUCO30)*	*Relevant EU Budget 2015*	*EU Budget contribution to baseline mitigation spending pathway (excl. Transport*	*EU Budget contribution to estimated mitigation investment needs pathway (excl. Transport)*
Mitigation – Total	234	382	17	Ca. 7 %	Under 5 %

In order to illustrate the type of detailed knowledge that can be gained if current investment levels are tracked and monitored in detail and how this can then indicate the remaining investment gap between needed investment volumes and current finance flows, we provide a brief summary of the three existing climate finance landscape analyses of Germany, France and Belgium in Box-1 below. For France, a comparison between actual investment levels and required future investment needs has been carried out and is also presented below.

Box 1 Summarised comparison of the three existing domestic finance landscapes: scope and results

All three existing landscape reports had roughly the same goal, namely mapping climate finance in each of these countries. However, their scope, level of detail and categorization is not identical to one another (see comparison table below). In the German report (2012) the scope was the most restrictive (only tangible mitigation topics, basically, energy efficiency, non-energy related reduction measures and RES) were taken into account. In the French report (2015) also investments in new nuclear plants and GHG reductions in agriculture, forestry and industrial processes were taken into account. In the Belgian report (2016) also climate services and climate adaptation were part of the scope. As such, the overall figures are not easily comparable.

		Landscape of Climate Finance in **Germany**			Landscape of Climate Finance in **France**			Landscape of Climate Finance in **Belgium**		
GENERAL	Authors of the report	CPI – Climate Policy Initiative			I4CE – Institute for Climate Economics			Trinomics and EY		
	Partners or sponsors				French Ministry for the Environment, ADEME, Climate-KIC, Caisse des Dépôts			FoD Environment, Climate Change Service		
	Year of publication	2012			Editions in 2014, 2015 and 2016			2015 (officially Jan 2016)		
	Year(s) covered	2010			2011 to 2015			2013		
SCOPE	Climate scope	Mitigation		X	Mitigation		X	Mitigation		X
		Adaptation		-	Adaptation		-	Adaptation		p
		Climate Services		-	Climate Services		-	Climate Services		X
	Sectoral scope X indicates strong coverage p indicates weak or partial coverage - indicates no coverage (1) eg.: railways, mass urban transport (2) eg: emissions from land-use, forestry, carbon sinks (3) eg: smart grids	Buildings	New buildings	X	Buildings	New buildings	X	Buildings	New buildings	X
			Retrofitting	X		Retrofitting	X		Retrofitting	X
		Transport	Vehicles	X	Transport	Vehicles	X	Transport	Vehicles	X
			Infrastructures (1)	X		Infrastructures (1)	X		Infrastructures (1)	X
		Agriculture	Energy	X	Agriculture	Energy	X	Agriculture	Energy	X
			Other GHG (2)	X		Other GHG (2)	p		Other GHG (2)	p
		Industry		X	Industry		X	Industry		X
		Energy	Fossil	p	Energy	Fossil	X	Energy	Fossil	p
			Nuclear	-		Nuclear	X		Nuclear	-
			Renewables	X		Renewables	X		Renewables	X
			Networks (3)	X		Networks (3)	p		Networks (3)	p
	Capital scope	Tangible, material assets		X	Tangible, material assets		X	Tangible, material assets		X
		Intangible assets, R&D		p	Intangible assets, R&D		-	Intangible assets, R&D		p

***Source**: I4CE/Trinomics development for October 2016 EEA expert workshop*

These differences in scope and methodologies should be kept in mind when reading the 58ummarized results of these landscapes, as presented below. For further details and an explanation of the assessment methodology, see Chapter 5 of the recent European Commission, DG Energy publication on 'Assessing the European clean energy finance landscape'[85].

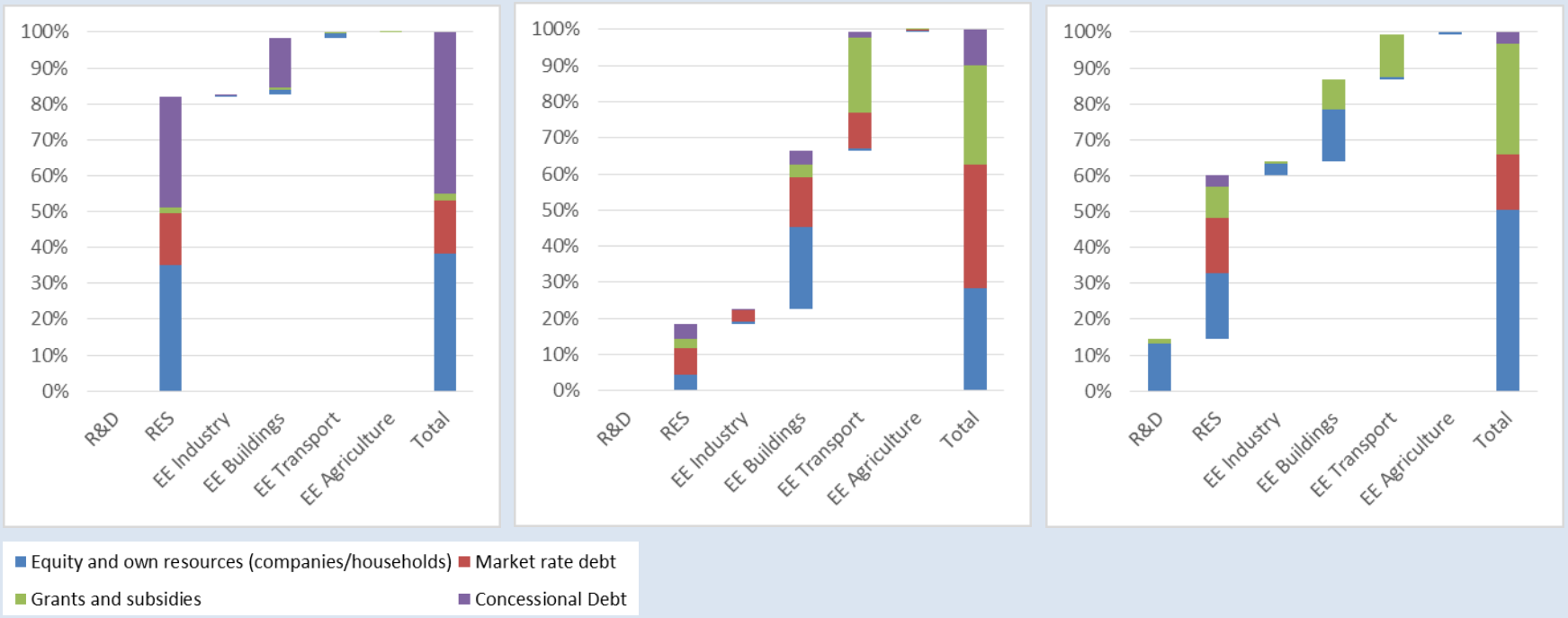
GERMANY: According to the Landscape of German Climate Finance[86], approximately €37 billion were invested in climate related projects in Germany in 2010. A large portion of investments in climate related projects in Germany is related to generation of energy through renewable sources. However, the structure of the German report is such that the investments are divided by sector (e.g. "buildings", "industry", etc.). Whereas this report represents under the labels/columns of "industry", "buildings", "transport" only those investments related to energy efficiency projects. Those amounts invested in the buildings sector that relate to installation of energy generating devices have therefore been summed up as "clean energy generation (CEG)". This represented often large sums: for example, the "buildings" sector invested €16.3 billion, of which €5.8 billion referred to energy efficiency and the rest to clean energy generation.

FRANCE: According to the French Landscape[87], France invested around €36 billion in clean energy related projects in 2013. This report was particularly detailed in what concerned the types of projects and less stringent assumptions had to be made in order to map the information back to the types of financial sources per type of projects. However, it was not always straightforward to separate those investments in the sector of buildings that referred actually to energy generation and this required making some assumptions about the data presented below.

BELGIUM: According to the Belgian Landscape[88], about €6.4 billion were invested in climate related projects in 2013, of which approximately €2.9 billion were invested in RES and €2.5 billion in energy efficiency. Of the three reports, Belgium was the only one that contained information on R&D spending, as well as on adaptation related activities. The figures actually refer to investments in "climate services", but a big part is related to R&D, another part to consultancy.

[85] Rademaekers, K, et al (2017). Assessing the European clean energy finance landscape, with implications for improved macro-economic modelling. Deliverable 3 of the Study on the Macroeconomics of Energy and Climate Policies. European Commission, DG Energy. https://ec.europa.eu/energy/sites/ener/files/documents/macro_eu_clean_energy_finance_final.pdf
[86] Juergens et al (2012). The landscape of climate finance in Germany. Climate Policy Initiative. http://climatepolicyinitiative.org/wp-content/uploads/2012/11/Landscape-of-Climate-Finance-in-Germany-Full-Report.pdf
[87] Hainaut et al (2015). Landscape of climate finance in France 2011-2014. I4CE Institute for Climate Economics. http://www.i4ce.org/download/landscape-of-climate-finance-in-france-2015-edition-full-report/?wpdmdl=13071
[88] Rademaekers et al (2016). Landscape of climate finance in Belgium. Federal Public Service (FPS) Health, Food Chain Safety and Environment, Belgium. http://www.klimaat.be/files/4914/6901/4152/Landscape_of_climate_finance_in_Belgium.pdf

Figure 2-2 Annual investment volumes by 'type of investment instrument' and 'mitigation investment opportunity' relative to the total amount of total mitigation finance spent (in %)



***Source**: Trinomics (2017) in 'Assessing the European clean energy finance landscape'*

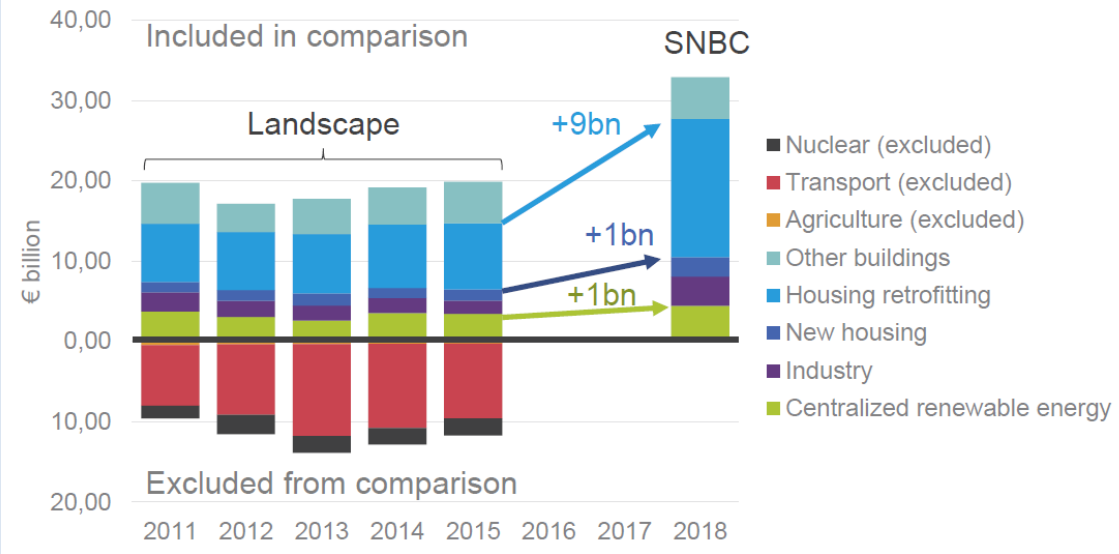
Lessons learned on data comparability from the French climate finance landscape

The experts involved in drafting the French domestic climate finance landscapes over the past years have conveyed an important lesson-learned: even if a country has estimated investment needs data and current actual spending figures available, it is still not easy to compare these at face value in order to gather an order of magnitude for the remaining financing gap.

Comparing investments covered in the Landscape report with those estimated as needed to implement the National Low-Carbon Development Strategy is challenging given the differences in perimeter and calculation methods applied. Due to these differences in scope and methodology, the experts chose to only estimate the financing gap for three sectors: the residential retrofitting, new housing and energy production sectors. The remaining financing gap for these three sectors amounts to approximately EUR 10-15bn per year in addition to the already realised EUR 16bn covered in the Landscape for these three sectors, in order to reach the average annual levels estimated as needed in the LCDS. The figure below

illustrates this partial financing gap assessment.

Figure 2-3 Comparison of current actual spending with estimated investment needs to reach national climate objectives according to the national low-carbon development strategy (LCDS)



***Source**: I4CE (2016). Landscape of climate finance in France, 2011-2014.*

While these figures may not be 100 % accurate due to issues involved with the comparability of the different datasets, it still shows the level of analysis and policy/public investment guidance such analysis can potentially give. For France, it is very clear that the largest financing gap exists in the areas of housing retrofits, followed by other buildings and to a much lesser extent centralised renewable energy and energy efficiency in industry.

2.2.2.3 The contribution of the EU Budget in adaptation finance

Given the large range in estimated adaptation investment needs and the difficulty of arriving at an overarching figure on European level encompassing all (or most) areas of adaptation action, it is currently not possible to quantitatively express the EU Budget's contribution to adaptation finance.

2.2.2.4 Options for improved targeting of the EU Budget's role in supporting specific mitigation and adaptation sectors/activities to better mobilise other available public and private sector finance

In order to understand where and how the EU Budget contribution to overall mitigation and adaptation investment needs can offer the highest added value (compared to money from other public and/or private sources), one needs to review its potential contributions on sectoral level in a qualitative manner taking into account current market failures and/or other barriers preventing private finance to cover the required investment needs.

When looking at mitigation, this report has gathered and presented the most relevant data in order to be able to assess the role of the EU Budget.[89] As a first step, a brief review of key investment drivers/barriers helps to better understand why certain financing sources are more easily attracted to and/or avoiding specific sectors and/or climate change activities. A recent DG ENER publication 'Assessing the European Clean Energy Finance Landscape'[90] has reviewed various of such influencing factors in detail. The report analysed a large number of factors which influence investments in the clean energy space, and grouped them into seven categories:

1. **Policy design, regulatory risk and public incentives uncertainties**: This includes all public regulations and public incentives at Member State or European levels; such as FITs, subsidies, grants, tax incentives, (etc.), which are put in place for the purpose of boosting the development of clean technologies and RES.
2. **Commercial necessities**: This comprises all indicators of financial health and success common to all businesses (such as ROI), irrespective of being from the clean technology industry or any other industry. It also encompasses the relative ease with which finance can be accessed to grow a business (debt condition and requirement, due diligence elements, etc.).
3. **Technology**: refers to elements specific to particular technologies; for instance, the timing of the revenue from solar or wind energy technologies.
4. **Country's enabling framework to support clean energy transition**: encompassing the ability of the infrastructure in a country to cater for new generation or new clean technology, where electricity grid infrastructure is particularly crucial.
5. **Governance, and accountability factors**: refers generally to all "soft" indicators linked to the governance of an investment. Factors such as so-called 'Environmental, Social and Governmental (ESG)' criteria are increasingly important for investors, especially long term large investors. This can drive investors to opt for clean energy investments for compliance with environmental and sustainability indicators or simply to present a "green friendly" image. It should be noted that legislative changes (see factor 1 above) are closely interlinked with this factor in the sense that legislation can have a strong impact on the governance of investments, such as the capital requirements (Basel).
6. **Macro-economic factors**: which includes all aspects linked to the external macro-environment which are relevant to the investment. For instance, economic factors such as international price of raw fossil fuels, interest rates, etc. or other societal trends such as public opinion, have a noticeable influence on investment decisions.
7. **Shortage of good investment projects and opportunities**: refers to the lack of good (bankable) investment projects and/or companies in the clean energy sectors. This is a fact brought forward by numerous investors at most stages of investment but especially at the early and later stages. This is only partially dependent on the other factors and is decisive enough for investors that it constitutes a factor on its own.

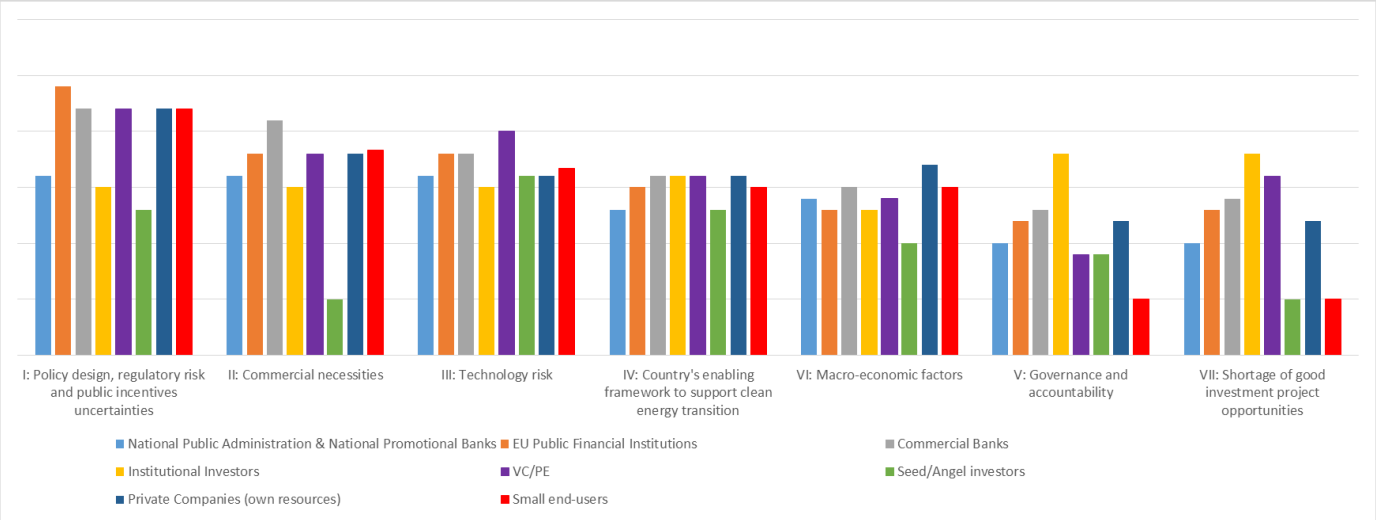
[89] For further information, see Trinomics (2017) 'State-of-Play of European climate finance tracking'. Available at: http://trinomics.eu/wp-content/uploads/2017/07/State-of-play-of-European-climate-finance-tracking-published-6-July-2017.pdf

[90] Rademaekers, K, et al (2017). Assessing the European clean energy finance landscape, with implications for improved macro-economic modelling. Deliverable 3 of the Study on the Macroeconomics of Energy and Climate Policies. European Commission, DG Energy. https://ec.europa.eu/energy/sites/ener/files/documents/macro_eu_clean_energy_finance_final.pdf

The following figures summarise the main findings and how they relate to the analysis carried out here.

Figure 2-4 shows which influencing factors are most important per type of investor. What can be seen from this analysis is that for almost all types of investors, 'policy design/regulatory risk', 'commercial necessities', 'technology risk', as well as 'country's enabling framework to support clean energy transition' make up key factors in their investment decisions. For large institutional investors, the 'shortage of good investment project opportunities' and their attention to 'governance and accountability' factors further limits their clean energy investment choices. Seed capital/angel investors are the group being least susceptible to influencing factors across the board.

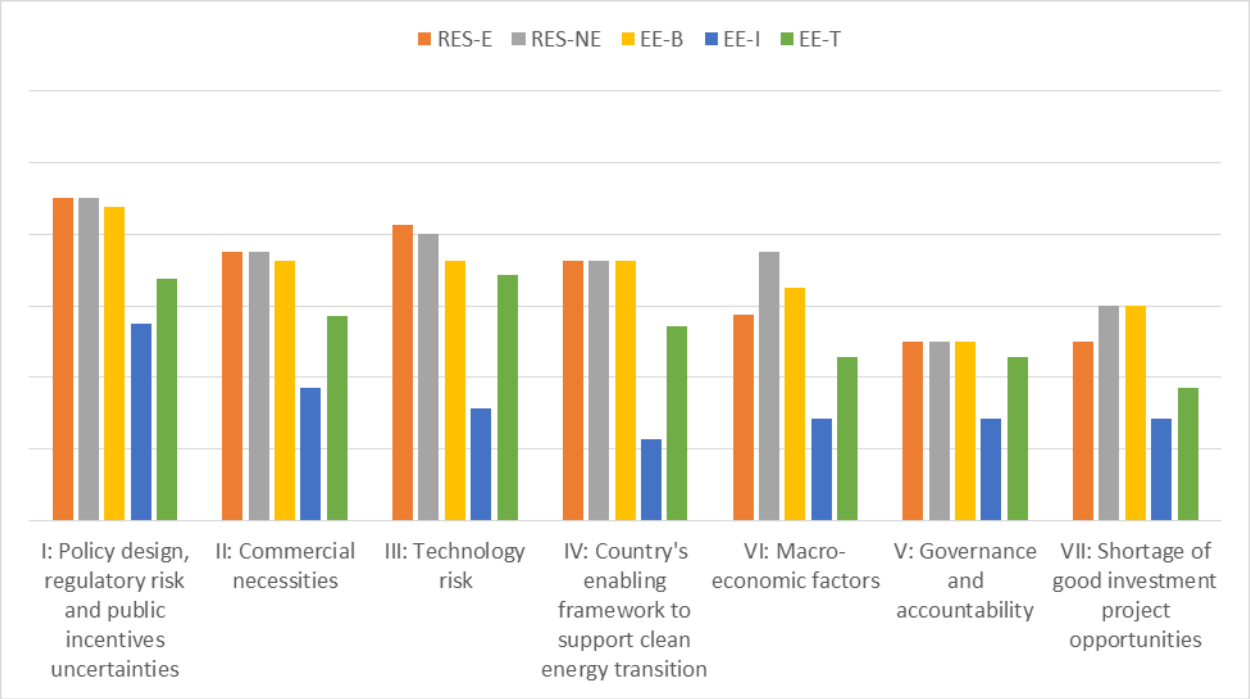
Figure 2-4 Ranking of influencing factor importance per type of investor



***Source**: Own development based on analysis delivered for DG ENERGY (2017) 'Assessing the European Clean Energy Finance Landscape'.*

The next figure shows which influencing factors are most important per mitigation action sector. As can be seen in the figure, 'policy design, regulatory risk and public incentives' is also the most important influencing factor across mitigation action sectors. From the perspective of mitigation action sectors, however, also 'commercial necessities' as well as 'technology risk' can pose a significant barrier. When comparing across different types of mitigation action sectors, one can observe that energy efficiency in industry is likely the least sensitive to the seven influencing factors.

Figure 2-5 Ranking of influencing factor importance per mitigation action sector



***Source**: Own development based on analysis delivered for DG ENERGY (2017) 'Assessing the European Clean Energy Finance Landscape'. Note: RES-E = established renewable energy technologies; RES-NE = new/ non-established RES technologies; EE-B = energy efficiency in buildings; RES-I = energy efficiency in industry; EE-T = energy efficiency in transport*

In summary, these findings show what (potentially) influences the quantity and direction of flows through the European mitigation finance landscape. With these influencing factors in mind and in combination with the known investment needs, it is then possible to prioritise certain climate change investment sectors for the EU Budget in order to maximise EU added value. When looking at these sectors, it is possible to identify – in a qualitative manner – certain areas where the EU Budget can certainly play and is de facto already playing a powerful role in incentivising and mobilising the needed investments. These are:

- **Energy Efficiency in Buildings**. This mitigation action sector has the largest additional investment needs and is already one of the EU Budget priority areas, including significant allocations from the Cohesion policy funds. Initiatives such as under EFSI (nZEB buildings) and the Sustainable Finance for Sustainable Buildings (SFSB) initiatives aim to either provide direct public finance, reduce current investment barriers, or leverage private finance.
- Another area of mitigation finance where the EU Budget should continue to play a role in (supporting) national public finance is **energy efficiency in transport**. This is a sector where either the infrastructure/equipment is publicly owned, or heavily regulated. Private investments in more energy efficient equipment (incl. private electric vehicles) is still lagging behind. A supporting role of the EU Budget and guidance via policy measures therefore is expected to be an effective use of EU Budget.
- Finally, while well-established renewable energy technologies such as solar PV or onshore wind are picked up well by private sources of finance and do not require EU Budget intervention, the EU spending should continue to focus on **supporting R&D into innovative RES technologies** and helping to accelerate their market readiness.

When looking at adaptation investment needs and the role of the EU budget, on the other hand, the analysis is much more challenging due to the inherent lack of data and information.[91] Nevertheless, in a qualitative way it is possible to deduct a few conclusions based on a combination of the urgency of the problem and investor behaviour due to influencing factors, Contrary to mitigation where the private sector is contributing the largest relative share of the financing volumes – adaptation measures across the various risk sectors are traditionally more a responsibility of public spending, e.g. flood protection, healthcare, etc., and therefore the private sector contribution to the overall adaptation finance volumes is expected to be significantly lower than the public sector contribution. This said, it is also observed that adaptation actions typically have a very local character based on the specific climate risks and vulnerabilities experienced in different localities. This means that in Europe adaptation plans and activities are typically driven by local and/or regional and national public authorities. This is highlighted by the fact that most Member States have their national adaptation strategies in place and some also have combined these with the related investment needs / investment strategies to reach the set targets. This being said, the EU Budget therefore best supports in two ways: (a) providing financial support to national and local public authorities in implementing their adaptation measures; (b) providing policy guidance for the various adaptation areas, such as water and flood management. Additionally, the EU Budget is currently supporting adaptation and could potentially play also in the future an important role in supporting those adaptation activities that may have a trans-national character and require working across national boundaries in a joint effort.

2.3 Options and Recommendations regarding the role of the EU Budget

1. Improved climate finance tracking

The Economic analysis accompanying the Mid-Term Review of the CMU Action Plan recognises the lack of hard data on sustainable finance, and that further work is needed to make use of the data on investments available under the European System of Accounts framework (Gross Fixed Capital Formation), its satellite system the European Environmental Economic Accounts and in the Structural Business Statistics to monitor the shift towards sustainability in investment patterns in the economy.[92] Similarly, the July 2017 interim report of the High-Level Group (HLEG) on Sustainable Finance urges that improved tracking of the EU's sustainable investment needs and financial flows is urgently needed. This is also one of the main conclusions emphasized by the European Environment Agency in their recent policy briefing 'Financing Europe's low carbon, climate resilient future'.[93] As mentioned throughout this report, some progress has been made with individual Member States and EU funds (e.g. ERDF and CF) on mapping climate finance landscapes tracking sources directing capital towards investments in climate mitigation and adaptation. However, such tracking is only in its early stages and could be extended more systematically across the EU with the end goal of a fully functional and coherent EU sustainable finance statistical system as proposed by the HLEG.

HLEG further suggests the EU could facilitate the creation of a common framework for sustainable finance tracking at the member state level, starting with climate change. "While ownership of this process by the member states is key, a coordination effort at the EU level – through creating a new 'observatory' function – could be useful for developing a common language on methods and tools, to aggregate the data, to inform collective decision-making and to help to target further policy interventions (including public finance) in relation to climate change mitigation and adaptation that may be required." Such an observatory would be well suited to also pick up the various data-related issues that have been raised in this report.

2. Using the potential of the National Energy and Climate Plans for optimising EU Budget mainstreaming and prioritisation

While the goal of this part of the report (Annex 1) was primarily to analyse the existing investment needs and the role of the EU Budget, many stakeholders recognised the need to also think a step

[91] For further information, see Trinomics (2017) 'State-of-Play of European climate finance tracking'. Available at: http://trinomics.eu/wp-content/uploads/2017/07/State-of-play-of-European-climate-finance-tracking-published-6-July-2017.pdf
[92] For further information, see page 68 of the economic analysis: https://ec.europa.eu/info/sites/info/files/staff-working-document-cmu-mid-term-review-june2017_en.pdf.
[93] EEA (2017). Financing Europe's low carbon, climate resilient future. Available at: https://www.eea.europa.eu/themes/climate/financing-europe2019s-low-carbon-climate

further as regards the current lack of data and a common reporting and tracking framework (as mentioned already under option 1 above). Stakeholders (both NGOs and MS representatives) have suggested a strong EU added value if the EU will further emphasise the importance and high potential of the National Energy and Climate Plans (NECPs) envisioned in the Regulation on the Governance of the Energy Union, which could serve as an instrument for Member States to set their ambitions regarding mitigation and adaptation activities and the corresponding investments to meet those ambitions. From the point of view of the German Ministry of Environment, for example, the NECPs could be employed for the process of national identification of investment and of specific projects in line with the EU 2030 targets. At the same time, they could also be used for planning processes such as the Projects of Common Interest. The systematic development of these NECPs would therefore provide better information at EU level and would eventually allow for a more efficient allocation of EU funds to Member States who pledge higher in terms of climate and clean energy targets. If such investment identification under the NECPs comprised risk assessment, too, it could further help identify both public and private investment needs, provide guidance for specific programmes and help deploy the MFF means where they are most needed, thus serving as an efficient horizontal mechanism of climate mainstreaming.

In addition, such forward-looking capital-raising plans on MS levels directly related to each MS's climate and energy objectives could also strengthen investor confidence and increase investment attractiveness for private finance sources.

Despite this high potential of the NECPs to support and optimise climate mainstreaming and prioritisation of the EU Budget, the NECPs delayed adoption will likely raise difficulties in linking them to the discussion on the MFF post-2020 in the context of climate and energy investment needs.

3. Supporting sectors and local authorities in their investment decisions

The sectors identified as having the greatest investment potential to attain 2030 and 2050 targets are transport and building sectors. Local actors are essential players in the investment decisions of both of them, but their respective needs in terms of applying for funding and implementing projects are currently not explicitly addressed. Given the lack of available, reliable data, local actors sometimes find themselves in the dark when it comes to planning investments. In this sense, establishing the afore-mentioned EU-wide Observatory could provide both the right authority for gathering data on risks and challenges, investment needs in order to address them and the right counselling for local, regional actors at the time of project development and implementation. This option has also been highlighted by one of the involved stakeholders.[94]

4. The important role of leveraging co-financing

With regard to the financing modes, the EU budget accounts for a significant share of the infrastructure investments in the EU, often enabling sustainable infrastructure projects that would not happen without EU budgetary support.[95] For example, in transport, roughly 85 % of the total amount of CEF funding awarded contributes to the decarbonisation of the European economy by enabling the modal shift to more environmentally-friendly transportation modes, in particular rail and inland waterways. As such, the rules applying to EU co-financing can have significant impact over the types and parameters of the investments that take place in MS. Therefore, the EU Budget's role in co-financing for both mitigation and adaptation should continue to be emphasised whenever possible.

5. A careful consideration needs to be given to the timing and changing needs of the EU Budget's value added

As has been emphasised by various stakeholders during their engagement, the EU's supporting role could have different priorities in terms of what type of activities to support throughout the energy transition process timeline. For example, gas infrastructure and other similar elements form a crucial component of the shorter term 'light green' transition which could be justified in line with 2030 targets. Yet, these investments may not be prioritised at a later stage of the transition, when EU Budget would likely add most value by supporting the 'dark green' type investments compatible with 2050 policy objectives.

[94] E3G (2017), Climate Action and the EU Budget: Priorities for the Next MFF. Available at: https://www.e3g.org/docs/2017_PDF_E3G_Key_issues_for_post_2020_MFF.pdf

[95] COM(2017) 358, Reflection paper on the future of EU finances. Available at: https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

Annex 1 Appendix 1 – Comparative analysis of investment needs studies

A1.1 Mitigation investment needs

Five key studies were identified. Even these five key studies are rather difficult to compare, as the scope is different (what is taken into account), they use different underlying models and assumptions, take into account different pathways to reach the low-carbon economy and concern different timeframes. Consequently, the result is that these studies offer a wide range of estimates (see Table 2-2 of the main report).

Depending on the main interest/goal of the reader, one may select one of these sources to serve as the main reference point on EU-level investment needs estimations. For the purpose of this report, the most recent impact assessment by the European Commission as part of the 2016 'Clean Energy for All Europeans' package is used as the main reference as it is the one most clearly in line with all recent policy targets and corresponding EU budget and programming efforts under the current MFF 2014-2020.

As regards the reported quantified investment needs estimates, the lowest total investment needs for Europe are estimated at 230bn EUR'10 annually and 300bn USD'12 annually, in the EIB 'Restoring EU competitiveness' report and the World Energy Investment Outlook (WEIO) by OECD/IEA (2014) respectively. One of the main explanations for this significantly lower 'investment needs figure' is the fact that these two reports excluded investment needs in the transport sector. The other reports indicate a minimum investment need of 900 bn EUR'10 (SWD, 2014) to reach the low-carbon economy in the EU, but these figures do include the transport sector. When increasing the level of ambition, for example by setting a target of 40 % energy efficiency increase, annual investments may reach up to almost 1600 bn EUR'13 (SWD, 2016). In the remainder of this sub-section, the report investigates these investment figures in more detail and explains why they differ as a result of the use of different scopes, methodologies and underlying modelling assumptions.

Geographic coverage

Table A1-1shows how different geographic coverages influence investment estimates, as reported by the World Energy Investment Outlook (OECD/IEA, 2014). While the OECD countries in Europe cover less countries than the current EU (only 25 countries), the climate investments here are estimated 16.7 % higher. This difference can likely be explained by the fact that the OECD includes relatively large countries like Norway and Turkey, while excluding Bulgaria, Croatia, Cyprus, Lithuania, Malta and Romania. For comparison to the global situation, European estimated investment needs comprise 11-14 % (depending on the scope) of the total global investment needs estimations.

Table A1-1 Annual investments in bn USD'12 between 2014 and 2035 for three different geographic areas

	Reference scenario	450 pathway
EU28	245	297
OECD Europe	286	346
World	2 189	2 405

***Source**: OECD/IEA, 2014*

Timeframes

As was shown in Table 2-2 of the main report, only SEC (2011) and SWD (2014) use the same timeframe, both giving investments between 2011 and 2050. SEC (2011) estimated cumulative investment needs to reach between 50.1 to 56.4 trillion EUR'08. Three years later the SWD (2014) scenarios showed a cumulative investment need between 40.8 and 44.8 trillion EUR'10. The difference between both estimates is very large, amounting up to around 10 trillion Euros. This difference must therefore be explained by other differences in the investment calculations, like the scope or the prices.

The reason why figures covering different timeframes should not be compared, lies in the fact that investment needs typically increase over time. This is explained by the fact that the cheapest decarbonisation options would generally be applied first, with the more expensive investments coming later in time. Also, it is possible that during a delayed investment in the early years, investment volumes in later years would have to be significantly higher in order not to fail the cumulative investment needs. This point therefore complicates the comparability to studies using different timeframes when no sub- time intervals are distinguished.

It is therefore not strange that the investment needs over 2021-2030 as given by SWD (2016) lie above the SWD (2014) estimates which cover the timeframe between 2011-2030. SWD (2016) estimates investment needs in the range of 1036-1565 bn EUR'13, SWD (2014) estimates amount only to 879-909 bn EUR'10.

Macroeconomic model inputs and outputs

To assess future investment needs, all five key reports use the PRIMES/GAINS framework model to analyse the long-term energy, transport and GHG emission trends. These models are based on the latest projections of for example economic development and demographic changes.

Table A1-2 shows the most important differences in the methodological set-up of the studies' underlying macro-economic assumptions. The most striking difference in inputs is the change of GDP projections over the years. In 2011 the SEC used much higher growth rates (2.0 % between 2010 and 2030). This interrelates with the oil prices, which are overall increasing with the downward adjusted GDP projections. Another important model input is population growth, which was similar for the reports. How different macroeconomic changes affected the eventual needs estimates requires an in-depth analysis of all the parameters and is beyond the scope of this report.

Table A1-2 Overview of important macro-economic model inputs

Key report	GDP growth	Energy pricing (per boe)
SEC (2011), Energy roadmap 2050	2.0 % (2010-2030) 1.5 % (2030-2050)	106 USD'08 in 2030 127 USD'08 in 2050
SWD (2014) 16, Impact Assessment (also the basis for EIB (2016)	1.5 % (2010-2020) 1.6 % (2020-2030) 1.4 % (2030-2050)	121 USD'10 in 2030 143 USD'10 in 2050
OECD/IEA (2014) World Energy Investment Outlook	~1.7 %*	128 USD'12 in 2035
SWD (2016) 405, Impact Assessment	1.2 % (2010-2020) 1.5 % (2020-2050)	110 USD'13 in 2030 130 USD'13 in 2050

** Not available in OECD/IEA (2014); this figure is presented in OECD/IEA (2015)*

Important macroeconomic outputs are shown in Table A1-3 below. Comparing the ETS prices of the different reports clearly shows that the price per tonne CO_2 equivalent was estimated higher (40) for 2030 in the 2011 SEC report compared to both SWD reports (35 and 34 respectively). The 2050 price on the other hand is estimated twice as high by SWD (2014) compared to SEC (2011).

Table A1-3 Overview of important macro-economic model outputs

Key report	Scenario / pathway	CO_2 pricing (per tonne CO_2-eq) in EUR'08	Cost of electricity (per MWh) in EUR'08	Total system cost (average annual) in EUR'08
SEC (2011), Energy roadmap 2050	Reference	40 / 52 / 50	154.8 / 151.1	2704
	High EE	25 / 87 / 234	154.4 / 146.7	2788
	Diversified	52 / 95 / 265	159.6 / 146.2	2735
	High RES	35 / 92 / 285	164.4 / 198.9	2795
	Low nuclear	63 / 100 / 310	168.2 / 157.2	2772
	Unit: EUR'08	*in 2030/2040/2050*	*in 2030/2050*	*up to 2050*
SWD (2014) 16, Impact Assessment	Reference	35 / 100	176 / 175	2067 / 2520
	GHG40/EE/RES30	11 / 152	178 / 192	2089 / 2891
	GHG40/EE/RES35	14 / 85	196 / 197	2102 / 2925
	Unit: EUR'10	*in 2030/2050*	*in 2030/2050*	*up to 2030/2050*
OECD/IEA (2014) World Energy Investment Outlook	NPS	~33	NA	NA
	450	NA	NA	NA
	Unit: EUR	*in 2030*	*NA*	*NA*
SWD (2016) 405, Impact Assessment	Reference	34	158	1928
	EUCO30	27	157	1952
	EUCO+33	27	158	1977
	EUCO+35	20	157	2014
	EUCO+40	14	159	2077
	Unit: EUR'13	*in 2030*	*in 2030*	*up to 2030*

Sectoral perspective

The differences in technological and sectoral scope between the studies makes up the key reason for the differences in the total mitigation investment needs estimates. The different scopes (or perspectives) applied are subsequently discussed below.

SEC (2011): Capital costs and direct efficiency investments:

In the Energy Roadmap 2050 the estimates were least detailed. Table A1-4 extracted capital costs plus direct efficiency investment costs. Capital costs include installations such as power plants, energy infrastructure, energy-using equipment, appliances and vehicles. Direct efficiency costs cover for example house insulation, control systems and energy management.

Table A1-4 Average annual energy system costs in EUR'10 (2011-2050) according to SEC (2011) Energy Roadmap 2050

	Reference	High EE	Diversified	High RES	Low nuclear
Capital costs	955	1 115	1 100	1 089	1 104
Direct efficiency investment costs	28	295	160	164	161
Total investment expenditure (excluding energy purchases)	**983**	**1 410**	**1 260**	**1 253**	**1 265**

** Excluding auction payments and disutility*

Besides these large items, the SEC (2011) also separately reported investments in the power sector. These are given in Table A1-5. In the decarbonisation pathways, the investments for the power sector reach 3.7 to 5.4 trillion EUR. Annually this translates to 91.7 to 134.9 bn EUR, about a tenth of the total investments in the energy system.

Table A1-5 Cumulative/average annual investments in EUR'10 (2011-2050) in the power sector (SEC, 2011) Energy Roadmap 2050

	Reference	High EE	Diversified	High RES	Low nuclear
Grid* (EUR'08)	1 269/31.7	1 518/38.0	1 712/42.8	2 195/54.9	1 793/44.8
Generation (EUR'05)**	NA	2 150/53.8	2 450/61.3	3 200/80.0	2 500/62.5
Power supply (EUR)	1269+/31.7+	3 668/91.7	4 162/104.1	5 395/134.9	4 293/107.3

** In the original document also intervals were distinguished up to 2020 and 2030, showing increasing grid investment costs with each interval*

*** Estimated from figure*

SWD (2014 and 2016): Energy system investment expenditures:

Both impact assessments of 2014 and 2016 make an almost similar division of investment expenditures required in the different sectors. The 2016 impact assessment also split up investments in households and the tertiary sector, which were grouped together in the 2014 assessment. We assume that these figures include the same subsectors for both assessments, which means that the differences are not explained by a different coverage scope, but by other aspects including a difference in timeframes, unit of measurement, decarbonisation pathways and underlying models.

Table A1-6 Average annual investment needs: comparing the two EC Impact Assessments

	SWD (2014) Average annual 2011-30 / 2031-50 in EUR'10			SWD (2016) in EUR'13 Average annual 2021-2030 In EUR'13				
	REF	GHG40EERES30	GHG45EERES35	REF	30	+33	+35	+40
Industry	19/30	37/152	31/148	15	19	24	29	51
Households	50/38	84/221	97/148	127	214	286	337	455
Tertiary				23	68	119	157	257
Transport	660/782	662/841	662/834	705	736	729	733	740
Grid	37/41	40/47	42/52	34	36	34	31	26
Generations & boilers	50/59	55/72	68/67	33	42	40	37	36
Total	**816/949**	**879/1 333**	**909/1 333**	**938**	**1 115**	**1 232**	**1 324**	**1 565**

Comparing these figures to SEC (2011), it looks like the impact assessments included the same demand and supply sectors. However, as the SEC (2011) is unclear in what is included in the total investments, we cannot confirm this. The power supply on the other hand is clearly comparable to SWD (2014), which also estimates cumulative investments between 2.5 and 2.7 trillion EUR'10. Striking are the relatively low power supply investments at SWD (2016), almost half the size in SWD (2014). This is however explained by the focus on efficiency measures; investments in the demand sectors are therefore on the other hand relatively large compared to SWD (2014).

OECD/IEA (2014): Energy supply and efficiency investments:

Detailed figures split by energy supply and demand sectors are given in Table A1-7

Table A1-7 Energy supply investments 2014-2035 in USD'12 (WEIO, 2014)

		Reference (NPS)		450 scenario	
		Cumulative investment	**Average annual**	**Cumulative investment**	**Average annual**
Fossil fuel supply	Oil	394	17.9	358	16.3
	Gas	531	24.1	453	20.6
	Coal	19	0.9	16	0.7
Power supply	Fossil fuels	224	10.2	161	7.3
	Nuclear	166	7.5	242	11.0
	Renewables	1 182	53.7	1 513	68.8
	Generation	**1 572**	**71.5**	**1 916**	**87.1**
	Transmission	139	6.3	153	7.0
	Distribution	516	23.5	497	22.6
	Grid	**655**	**29.8**	**650**	**29.5**
Biofuels		44	2.0	136	6.2
Total energy supply		**3 214**	**146.1**	**3 528**	**160.4**

Table A1-8 Energy efficiency investments 2014-2035 in USD'12 (WEIO, 2014)

	Reference (NPS)		450 scenario	
	Cumulative investment	**Average annual**	**Cumulative investment**	**Average annual**
Industry	93	4.2	172	7.8
Transport	1 250	56.8	1 771	80.5
Buildings	961	43.7	1 382	62.8
Total energy efficiency	**2 303**	**104.7**	**3 325**	**151.1**

WEIO is the only one of the four reports that includes fuel supply as investments. The other three reports reported fuel supply separately as energy purchases instead. The power supply figures are to a large extent comparable with the other publications. Total power supply investments amount up to about 116 USD'12 annually in the 450 scenario. This translates to 90.3 EUR'12 [96]. Between 2011 and 2030 the investments were estimated 95 EUR' by SWD (2014) in the most comparable scenario of GHG40/EE/RES30.

Another important difference between the WEIO and the impact assessments is present at the demand sectors, which are estimated significantly higher at the SWD impact assessments. The largest difference is found at the transport sectors, showing investment expenditures about ten times as high compared to WEIO. The explanation to this lies in the fact that the impact assessments included investments in total purchases of transport equipment for households and businesses. The differences have a large impact on the total needs estimates and signify how a difference in scope could lead to very large differences, as the total needs of the WEIO are about a third the size of the other reports, while it does include fuel supply investments. In this case it is more meaningful to

[96] 2012 exchange rate of 0.778294 EUR/USD, from: https://data.oecd.org/conversion/exchange-rates.htm

compare the gaps at both reports. This reveals only additional investments required for the low-carbon economy, with that excluding items which cancel each other out as they are present at both the reference and decarbonisation scenarios. In that case the additional investments required at the demand sectors between the WEIO and the EC's impact assessments become much more comparable.

EIB (2016): Total investment needs in the energy sector:

The EIB investment needs figures are broken down into three main sectors relevant for the EU's competitiveness (i.e. the main objective of the report): energy security, networks and efficiency because the secure supply of energy at reasonable prices to industry and households is crucial to Europe's competitiveness. The report concludes that the sizable potential in Europe is largely unrealised. The main reasons listed for this lack of investment include (a) poor information availability, (b) split incentives for rental buildings, (c) lack of access to finance, and (d) subsidies that weaken incentives in some parts of the EU. Table 5 of the EIB report provides a breakdown of investment needs into the three main sectors covered by the report, as presented in Table A1-9 below.

Table A1-9 Total energy sector investments 2016-2030 (EIB, 2016)

	Reference – Current spending (in Bn EUR'15)		Required needs (in Bn EUR'10)	
	Cumulative investment	**Average annual**	**Cumulative investment**	**Average annual**
Energy efficiency savings in buildings and industry	630	42	1 680	112
Power generation, including renewables	615	41	795	53
Upgrading energy networks (gas and electricity)	705	47	960	64
Total energy sector	**1 950**	**130**	**3 450**	**230**

A1-2 Adaptation investment needs

Similar to the discussion on estimated mitigation investment needs discussed previously, this section provides detailed information regarding the underlying assumptions, methodologies applied, etc. in an attempt to still interpret those numbers that do exist in a meaningful way.

Geographic coverage

Of our seven selected key studies covering European-wide adaptation finance needs, none of the documents fully covers the 39 EEA countries which are the case of subject here. In fact each of the reports studies a different geographical coverage.

The largest geographical overlap is between ClimateCost (2011), Ciscar et al. (2014), Forzieri et al. (2016) and BASE (2016) – notably also the more recent reports. ClimateCost considers EU27. For the estimation of adaptation finance as a result of sea level rise, only the coastal lines of the EU were taken into consideration, including the overseas French regions. This is the only study which gives a rough quantitative indication of the distribution of required finance over the individual countries. Ciscar et al. includes only EU27 (before the inclusion of Croatia). The study by Forzieri et al. best matches our scope, as it covers EU28, including Iceland, Norway and Switzerland. The 2016 BASE project uses a different geographical scope for each adaptation category, which mostly comes down to EU28. Additionally, this study distinguishes different regions within Europe.

More deviant geographic areas are covered by the older reports under discussion here. UNFCC (2007) covers only OECD Europe, which is a type of categorisation which only includes 23[97] European – predominantly wealthy – countries. De Bruin et al. (2009) only includes Western Europe. At last Markandya & Chiabai (2009) covered the largest geographical area, including Europe in its

[97] Currently OECD Europe counts 25 Member States, including also Estonia and Slovenia. At the more recent OECD/IEA (2014) report discussed in section 3.1.2 of Annex 1 these countries are also included.

broadest definition; including the three microstates but no indicated inclusion of Kosovo and Liechtenstein. At this report also Israel and all CISs[98] are included under Europe. We recognize this geographical area is much larger (total 53 countries) than our scope, but as this report is the only health estimate available we nevertheless chose to include it here.

The use of these different geographical coverages highly complicates the comparability of the studies. The difference between EU27 and EU28 is straightforward, here an estimation of its effect on the estimates is not too complicated to assess. However, especially the older documents use very unusual geographical scopes and complicates the assessment of inclusion or exclusion of certain countries. For comparison, we shortly discuss the difference in estimated investment needs on a global level. Table A1-10 sets out UNFCCC (2007) results, showing that infrastructure investments are almost eight times as large on a global level, coastal zones six times larger and investments for water and flood protection are 10 up to 29 times as large compared to the European (OECD) level. De Bruin et al. (2009) estimate global adaptation finance required six times larger compared to Europe alone. Costs to adapt to the impacts of diarrheal diseases as a result of climate change are 31 times as high on a global level (Markandya & Chiabai, 2009). This factor is much higher for health impacts, as the developed Western Europe has a strong health care system to be able to offer resilience to such health impacts. This emphasises the importance of taking into account the geography and the subject of matter, when comparing adaptation finance.

Table A1-10 Average annual investments in bn USD in 2030, comparing EU estimates to the global level

		Infrastructure	Coastal zones	Water & flood protection	Total
A1B	OECD Europe	4.26-17.05	0.74	21.8	**26.75-39.54**
	World	32.51-130.06	4.70	224.5	**261.72-359.26**
B1*	OECD Europe	1.00*-4.00	0.62	6.3	**7.92-10.92**
	World	7.63*-30.51	4.01	180.0	**191.64-214.52**

** For infrastructure, the lower-bound scenario was based on Munich RE data*

Timeframes

The timeframe of adaptation needs estimates are in general longer than the timeframes used at mitigation needs, as here you need to be prepared for climate change impacts which may occur only after almost another century. As came forward in Table 2-8, the most common used timeframe at adaptation needs estimates runs from 2011 up to 2100. Forzieri et al. (2016) very clearly show that taking into account longer timeframes increases the adaptation costs, as you will make sure to prepare for impacts taking place later. Taking into account adaptation needs up to 2070 requires more than twice as much average annual investments compared to a short-term timeframe up to 2040. The long-term timeframe requires investments which are almost four times as large annually. Those three periods are commonly referred to as running up to the 2020s, 2050s and 2080s.

The adaptation investments as reported by ClimateCost and Ciscar et al. on the category of coastal zones are most comparable. UNFCCC only reports on figures *in* 2030, which may be comparable to average annual investments in the 2020s interval (2011-2040). The timeframe used by Markandya & Chiabai is relatively short and has a very early starting date (2000-2030). Odder is the timeframe used by Bruin et al. – which strikingly do not consider any intervals – as it is very lengthy (2025-2185), obstructing comparability.

Additionally, we would like to highlight here that as with mitigation, the investment needs estimates typically increase with increasing time horizons. This could for example be a result of more detailed climate models (estimating larger climate change impacts) or the use of different models in general taking into account more adaptation measures. Table A1-11 shows the average annual investments by three different reports, which estimates increase with timing of the report. It must be noted that these three studies also used a slightly different geographical scope (OECD Europe, coastal Europe and EU27). However, as coastal change is considered we assume that the geographical coverage largely overlaps.

[98] Commonwealth of Independent States: Alliance of former Soviet Republics, as of 2007 existing of: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Uzbekistan and Ukraine.

Table A1-11 Average annual investments required for coastal adaptation (A1B scenario)

	UNFCCC (2007)	ClimateCost (2011)	Ciscar et al. (2014)
2011-2040	0.59	0.5	1.0
2041-2070	-	1.1	2.0
2071-2100	-	1.2	2.5

[* Reports average investments required in 2030 only. Converted from bn USD'05, with an exchange rate of 0.80412 EUR/USD as reported by OECD Data: https://data.oecd.org/conversion/exchange-rates.htm]

Macroeconomic model inputs and outputs

Unlike at mitigation, EU scenarios are not necessarily based on projections of a changing economy, but rather a changing climate. De Bruin et al. (2009) do explain how their model uses macroeconomic inputs like GDP projections, as it integrates adaptation costs with Integrated Assessment models. These IA models are commonly used to model mitigation costs, as they project aspects like resulting energy demand resulting in different emission levels. Required adaptation measures are indirectly linked to the achieved level of mitigation (and therefore macroeconomic inputs), but only de Bruin et al. (2009) clearly present this link between the two costs. De Bruin et al emphasises that mitigation and adaptation investments should not be considered separately, as investments in mitigation levels would reduce the required investments in adaptation levels. The report on the 2016 BASE project also included an analysis on how GDP effects influence the cost effectiveness of adaptation versus mitigation. Most adaptation studies however only explore the different resulting climate scenarios, which are indeed a result of mitigation efforts and associated investments.

Interestingly, the outputs (required investments) for adaptation are more commonly expressed in macroeconomic terms. For example, JRC presents investment levels as percentage of the GDP, as well as Agrawala et al. (2009), which is not further discussed in this report as it solely reports the adaptation needs as percentage of GDP.

The use of IA models, in this case combined with AD-RICE, as done by de Bruin et al. is exceptional. In general, the studies used different models to calculate investment needs on the basis of models which are specific for each adaptation area. Both ClimateCost and Ciscar used the DIVA model to model required protection measures taking into account the population size in an area: the greater the population, the greater the demand for safety. Similarly, LISFLOOD simulated spatial patterns of water flows in European rivers at ClimateCosts. For the air-conditioning demand and accordingly investments the POLES model was used here. The BASE project model is AD-WITCH, supplemented by the ClimateCrop model to estimate agriculture needs.

Not all reports used complex models to describe the required adaptation investments. Infrastructure investments in UNFCCC are calculated using the rule of thumb that additional costs for adaptation are 5 to 20 percent higher than current investments. Some studies, as recognized by the UNFCCC, indicate however that some infrastructure investment needs might be 30 percent higher. Forzieri et al. use a completely different approach, taking into account the benefit-to-cost ratio. This is assumed to be 2.5 on average (literature review), which means that the adaptation costs are derived from the benefits. At last Markandya & Chiabai estimated adaptation costs for diarrheal looking only at population projections, estimated incidence ratios and average health intervention costs.

Adaptation to different climate change projections – comparison of scenarios

For mitigation future finance needs are often presented as dependent on different pathways, which could differ on the pathway towards the low-carbon economy or more ambitious levels of decarbonisation. For climate adaptation the possible range of investment needs is rather dependent on the future projections of climate change – whether or not related to the socio-economic pathway - as the forecasted impacts determine what level of adaptation is required. Notice also how this is very much related to mitigation, as decarbonisation will abate climate change itself. It is important to present the adaptation needs for different climate scenarios, as future climate models and impacts have a considerable level of uncertainty. Policy makers need to take into account this level of uncertainty, as it signifies the need to plan robust strategies even under remaining uncertainties.

A noticeable difference to scenario usage for estimating mitigation investment needs is that it is not common to investigate reference scenarios for adaptation (i.e. adaptation investments which are

already spent based on existing policies, projected into a future time horizon). This is because adaptation is inherently different from mitigation, in the sense that we are always interested in the investment levels required to cope; not coping is simply not important. If reference scenarios are mentioned, these imply adaptation needs in a scenario with the current business-as-usual climate impacts, without additional mitigation efforts. Below we will shortly explain the different scenarios which were explored in the seven key studies, to give an indication on how different scenarios influence the results.

UNFCCC (2007), Investment and financial flows to address climate change:

The UNFCCC explored two different 'SRES' scenarios, also referred to as storylines describing different future world (and the associated emissions). Also within these scenarios a range is presented, as for infrastructure investments the needs were estimated to be between 5 to 20 % higher than current levels.

1. A1B scenario (27-40 bn USD): a world characterized by rapid economic growth, but with a balanced emphasis across the energy sources
2. B1 scenario (8-11 bn USD): a more integrated world, characterised by reductions in material intensity and with an emphasis on global solutions to economic, social and environmental stability. For infrastructure no B1 scenario was ran, but Munich RE data was used to show the minimum required investment needs to adapt infrastructures to climate change.

ClimateCost (2011), The impacts and economic costs of climate change in Europe and the costs and benefits of adaptation:

The first scenario explored is referred to as the reference scenario, similar to the first scenario explored by UNFCCC (2007). This scenario is compared to a scenario where EU targets of climate change mitigation are met.

1. A1B mid scenario (~18 bn EUR): a 'no mitigation' business as usual scenario, showing global average temperature rises between 1.6-2.3˚C by 2041-2070 and 2.4-3.4 ˚C by 2071-2010 (relative to the modelled baseline period (1961-1990). The scenario is called a 'mid' scenario as it showed the average of an ensemble of twelve A1b simulations.
2. E1 scenario (~12 bn EUR): a mitigation scenario, equivalent to the EU target to keep warming below 2˚C above pre-industrial levels.

De Bruin et al. (2009), Economic aspects of adaptation to climate change:

This report explores in essence one storyline, but includes a scenario of higher damage levels than expected in the original model.

This report only

1. Base model (155 bn USD): The base model assumes an optimal control scenario, applying both mitigation and adaptation policies, set on a level with a maximum value of net economic consumption discounted over income per capita.
2. Higher damages (509 bn USD): A higher bound is explored additional to the base model, which scales up the damage function by 2.5 times (suggested after criticism on the model).

Markandya & Chiabai (2009), Valuing climate change impacts on human health: empirical evidence from the literature:

Adaptation investment needs for diarrheal diseases were presented as a result of three different climate scenarios, varying from unmitigated emission (UE) trends to two stabilization scenarios.

1. UE (12-260 mln USD'00): This scenario approximately follows the IPCC IS92a scenario, which is considered the 'business-as-usual' scenario, where mitigation emission trends take place.
2. S750 (12-217 mln USD'00): The second scenario is a stabilization scenario, where mitigation does take place, up to a level of 750 ppm CO_2 achieved by 2210.
3. S550 (12-205 mln USD'00): This stabilization scenario is more ambitious, reaching 500 ppm of CO_2 levels already in 2170.

Ciscar et al. (2014), Climate Impacts in Europe. The JRC PESETA II Project:

At the PESETA II project only one scenario of investment needs was considered, which considered public adaptation measures to respond to the climate change impacts. This scenario was also compared to a reference scenario (no adaptation), analysing the damages in both scenarios in order to investigate whether adaptation investments outweigh the benefits (avoided damages), see also box 3.1 on an explanation of the different types cost analyses. Ciscar et al. (2014) found a welfare loss of 42.3 billion Euros under a scenario with no adaptation, which was reduced to only 1.6 billion Euros with adaptation.

Forzieri et al. (2016), Resilience of large investments and critical infrastructures in Europe to climate change:

Forzieri et al. did not consider a range of the common climate scenarios, but they explored how taking into account – or preparing for - climate change impacts on the longer term influenced the finance needs. These were considered in a SRES A1B business-as-usual scenario.

1. Short (2020s) term (0.4 bn EUR): The shortest future time window adapts to impacts up to the 2020s, which is a timeframe from 2011 to 2040.
2. Medium (2050s) term (0.9 bn EUR): Investments needs for the medium-term run up to the 2050s, which is the period between 2041 and 2070.
3. Long (2080s) term (1.5 bn EUR): Adapting on the long-term takes into account impacts up to the 2080s: 2071-2100.

BASE (2016), EU-wide economic evaluation of adaptation to Climate change:

Costs and benefits were explored for all three different socio-economic pathways and two Remote Concentration Pathway (RCP) climate scenarios were explored, resulting in a matrix of nine investment needs. These are not given here, as they differed for each area of adaptation.

Socio-economic pathways:

1. SSP2 ‘Middle of the road’:
2. SSP3 ‘Fragmented world’:
3. SSP5 ‘Market-driven development’:
4. Remote Concentration Pathways:
5. RCP 4.5 ‘Average climate change’:
6. RCP 8.5 ‘High climate change’:

Annex 2: Analysis of existing approaches and processes of mainstreaming in EU instruments

1 Introduction

1.1 Policy context

1.1.1 EU Energy and Climate commitments

The European Commission is looking at cost-efficient ways to make the European economy more climate-friendly and less energy consuming. Its low-carbon economy roadmap[99] suggests that by 2050, the EU should cut greenhouse gas emissions to 80 % below 1990 levels. Milestones to achieve this are **20 % emissions cuts by 2020[100], and 40 % by 2030**[101]. Alongside these mitigation targets, the **EU Adaptation Strategy**[102] helps to ensure that adaptation considerations are addressed in all relevant EU policies.

The delivery of the EU's climate objectives will require significant investment. At the time that the **Europe 2020 Strategy** was adopted, it was estimated that by 2020 public and private investment of ~€125 billion per annum would be needed to carry out climate mitigation actions across all sectors (including agriculture, buildings, energy, industry, transport, and waste). Further investment is also necessary for climate adaptation actions; and climate resilience needs to be built in to all long-term investments.

1.1.2 The Multiannual Financial Framework (MFF)

The Multiannual Financial Framework (MFF) provides a framework for financial programming at the EU level. It lays down the maximum annual amounts ('ceilings') which the EU may spend in different political fields ('headings') over a period of at least 5 years. It also allows the EU to carry out common policies over a period that is long enough to make them effective. This long term vision is important for potential beneficiaries of EU funds, co-financing authorities as well as national treasuries.

With a view to responding to the challenges and investment needs related to climate action, the European Commission is implementing a mainstreaming methodology during the current (2014-2020) MFF including by aiming to make at least 20 % of EU expenditure climate related.[103] The 'reflection paper on the future of EU finances'[104] published by the European Commission in late June 2017 further emphasises this aim to streamline and simplify the EU budget system in order to facilitate more efficient spending.

1.2 Objectives of the report

The objectives of this report are to provide a review of how the current (2014-2020) MFF arrangements for mainstreaming, and for tracking climate-related expenditure and its achievements, have operated in practice; and to make recommendations for potential options for improving the current approach and processes.

1.2.1 Scope of the current report

As part of the report a review has been performed of the different approaches that have been taken to mainstream climate change issues into EU budget programmes and financial instruments, as well as the approaches to track climate expenditure (inputs) through budget programmes, the leverage of investment from financial instruments (outputs) as well as the overall effects of these investments on greenhouse gas emissions and climate adaption actions (results).

---

99 COM (2011) 112, A roadmap for moving to a competitive low carbon economy by 2050. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0112
100 COM (2010) 639, Energy 2020. A strategy for competitive, sustainable and secure energy. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1409650806265&uri=CELEX:52010DC0639
101 COM (2014) 15, A policy framework for climate and energy in the period from 2020 to 2030. Available at: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52014DC0015
102 An EU Strategy on adaptation to climate change, COM(2013) 0216, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013DC0216
103 COM(2011) 500, A budget for Europe 2020. Available at http://eur-lex.europa.eu/resource.html?uri=cellar:d0e5c248-4e35-450f-8e30-3472afbc7a7e.0011.02/DOC_4&format=PDF
104 COM(2017) 358, Reflection paper on the future of EU finances. Available at: https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

Separate reports have been prepared for each of the different elements of the review (mainstreaming, inputs, outputs, results), along with a further report assessing the investment needs associated with the EU's climate targets. This current report presents the findings from the review of approaches to mainstreaming of climate related expenditure in the EU budget.

2 Methodology

This section describes the methodology that has been followed to deliver the analysis of existing approaches and process of climate mainstreaming in EU instruments. In the below sections we (i) reflect on definitions and methodological issues that have implications on our analysis, (ii) present a methodological approach which is based on the various stages of the MFF policy cycle, (iii) describe our data collection and analysis methods, and (iv) explain how we developed options for future improvement.

2.1 Selection of the budget programmes

An initial step in the analysis involved the selection of the specific budget programmes and financial instruments to be analysed in more detail.

While mainstreaming climate change considerations is important for all areas of the budget, in practice the potential for different areas of expenditure to deliver greenhouse gas (GHG) savings, or increase climate resilience, will vary considerably between the different budget programmes and financial instruments. It was therefore agreed that the review should focus on those areas of the budget that are expected to have the most significant climate-related impacts, since this is where the need for robust approaches to climate tracking are most important.

The programmes were selected on the basis of their relative contribution towards the total climate-related expenditure, as reported in the Staff Working Document accompanying the Mid-term Review of the MFF (SWD(2016)299)[105]. More specifically, **all budget programmes with an expected climate-related expenditure of >1 000 million Euro, over the 2014-2020 programming period, were included in the in-depth analysis.** These cover 99.6 % of the total EU budget for 2014-2020. These budget programmes were:

- European Earth Observation Programme (Copernicus)
- Horizon 2020 – The Framework Programme for Research and Innovation
- Connecting Europe Facility (CEF)
- European Regional Development Fund (ERDF)
- Cohesion Fund (CF)
- European Social Fund (ESF)
- European Agricultural Guarantee Fund (EAGF)
- European Agricultural Fund for Rural Development (EAFRD)
- European Maritime and Fisheries Fund (EMFF)
- Programme for the Environment and Climate Action (LIFE)
- Instrument for Pre-accession Assistance (IPA II)
- European Neighbourhood Instrument (ENI)
- Development Cooperation Instrument (DCI)

The programmes were assessed on the basis of their legislation and other available documentation, information on the Commission website, and interviews with Commission officials to clarify key points. This assessment was carried out for each programme, covering all the areas of investigation under the study (Annexes 1-6).

2.2 Definitions and methodological issues

This analysis involves the study of **climate mainstreaming in the EU budget at two levels**. The first level, and the one on which there is most information available, concerns the conscious decisions made in relation to achieving the requirement that climate action objectives "will represent at least 20 % of EU spending in the period 2014-2020"[106]. The 20 % climate expenditure target in this sense is

105 Commission Staff Working Document *Accompanying the document* Communication from the Commission to the European Parliament and the Council – Mid-term review/ revision of the multiannual financial framework 2014-2020. An EU budget focussed on results. SWD(2016)299. Brussels, 14.9.2016., http://ec.europa.eu/budget/mff/lib/COM-2016-603/SWD-2016-299_en.pdf

106 European Council conclusions of 7-8 February 2013. Multiannual Financial Framework. EUCO 37/13, https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/135344.pdf

a key tool to support mainstreaming climate change objectives into the EU budget as a whole; but it is one element in the mainstreaming of climate in the EU budget, and not the only approach adopted (see more in section 3.1). It is important to make a clear distinction between climate mainstreaming and climate-related expenditure tracking (which is covered in Annex 3). While Annex 3 looks into the methodologies used at the EU level to track climate expenditure inputs in EU programmes the current Annex provides an analysis of the current broad approach taken under the various EU funds to integrate climate objectives into the relevant policy areas but it also considers the impact of the 20 % target on the integration of climate objectives into budget allocation decisions. As such, our analysis focuses on the broad approach to mainstreaming in different programmes under the EU budget, rather than the detailed analysis of inputs, results, and (for financial instruments) leverage that is the subject of other tasks of the study.

2.3 An approach based on relevant stages of the MFF policy cycle

We have based our analysis on the different stages of development of policy on multiannual financial planning. This differs from the standard policy cycle (which broadly covers problem definition, policy formulation, policy adoption, implementation and policy evaluation) because it is focused on one particular type of instrument – public expenditure – deployed at EU level, and because the process of negotiation and approval of the European Multiannual Financial Framework (MFF) is unique, with specific timescales. Figure 2.1 shows **the main steps of the EU's MFF**: first the European Commission (EC) presents its proposal for the new MFF, including proposals for the overall budget, headings and priorities. This proposal is then discussed within the European Parliament (EP) and the Council and with the co-decision process a final agreement is reached. With the newly agreed financial envelopes for the funding programmes the fund-specific regulations are also co-decided, after which the new MFF enters into force. The mid-term review of the MFF serves as an important step for the start of the discussions on the forthcoming MFF.

The EU's MFF are currently 7 years long[107]. For the 2014-2020 programming period the EC presented its proposal in 2011[108] (which was later amended in 2012[109]) and after two years of intense negotiations on 2 December 2013 the Council adopted the MFF Regulation[110]. While the climate mainstreaming approach was already included in the European Commission's proposal in 2011, the commitment to it from the European Council came at a relatively late stage in the process.

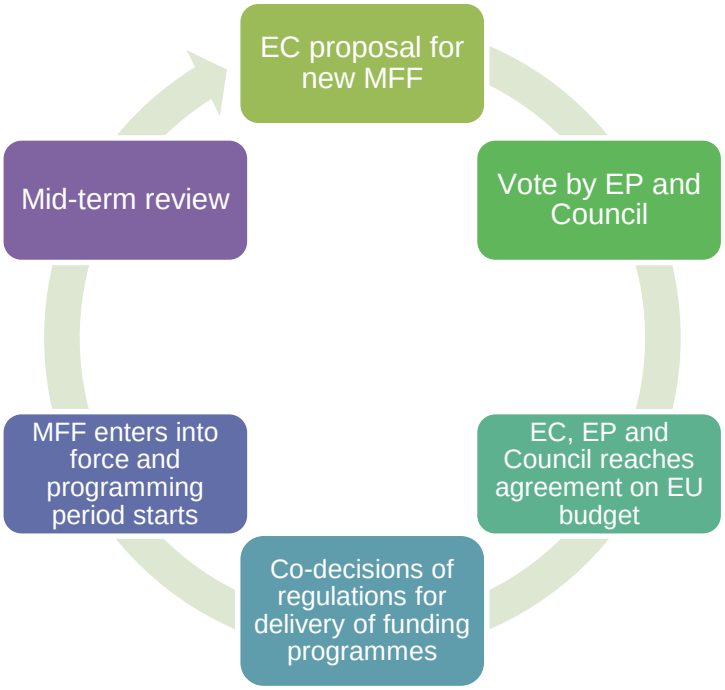
[107] Although other time periods would be possible. Article 312 TFEU stipulates that the MFF "shall be established for a period of at least five years"

108 European Commission Communication. A budget for Europe 2020. COM 2011/500., http://ec.europa.eu/budget/library/biblio/documents/fin_fwk1420/MFF_COM-2011-500_Part_I_en.pdf

109 European Commission. Amended proposal for a Council Regulation laying down the multiannual financial framework for the years 2014-2020. COM 2012/388, http://ec.europa.eu/budget/library/biblio/documents/fin_fwk1420/MFF_COM_2012_388_en.pdf

110 Council Regulation No 1311/2013 laying down the multiannual financial framework for the years 2014-2020, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:347:0884:0891:EN:PDF

Figure 2.1: The EU MFF cycle

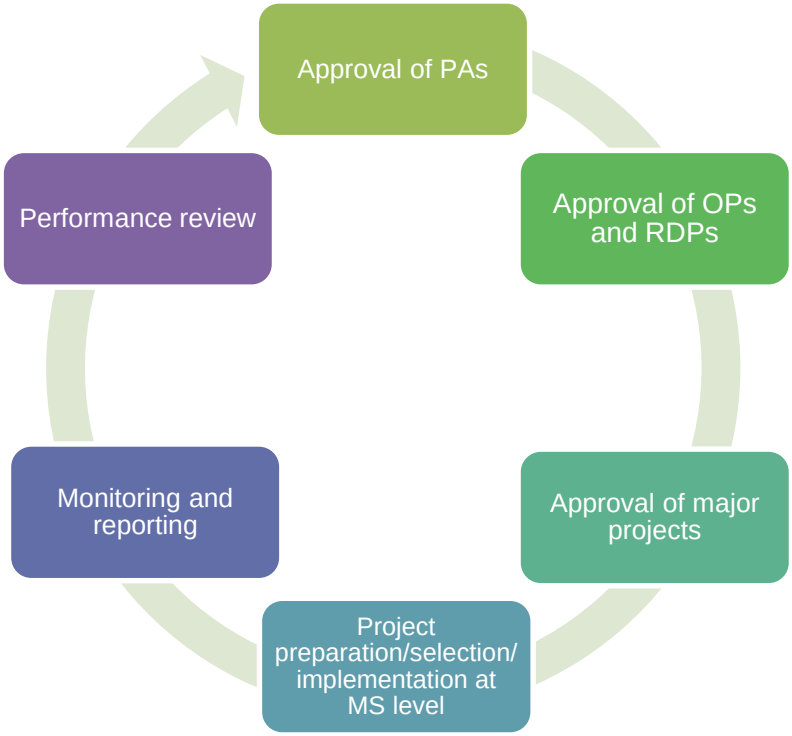


Source: own development

The way in which the EU funds are managed also has important implications on the operation of the specific funds. Around two-thirds of the EU budget are under shared management, which means that much of the implementation of the budget of these specific funds are delegated to the Member States (MS). **The five funds which are currently under shared management include the EAFRD, ERDF, Cohesion Fund, ESF, and the EMFF, which are also called as the European Structural and Investments Funds (ESIF).** Figure 2.2 presents a stylised policy cycle of these funds. For the first time in the 2014-2020 programming period all MS were required to develop Partnership Agreements (Pas) setting out the intended use of ESIF expenditure over the seven year period. As in previous programming periods MS were also required to develop Operational Programmes (Ops)[111] and Rural Development Programmes (RDPs)[112] which break down the overarching strategic objectives agreed in the Partnership Agreement into investment priorities, specific objectives, and further into concrete actions. While MS do not generally need to submit project level information to the EC, major projects supported by the ERFD and Cohesion Fund are an exception; for these projects, with a total eligible cost exceeding €50 million – or €75 million for projects under Thematic Objective 7 – information has to be provided to the EC and separate approval has to be granted. After the approval of these strategic documents and investments the various stages of project level work can start to go ahead. The final stages of the cycle are the monitoring and evaluation of the programmes with a specific focus on performance review.

111 In the case of ERDF, Cohesion Fund, ESF and EMFF.
112 In the case of EAFRD.

Figure 2.2: Stylised policy cycle of EU funds under shared management

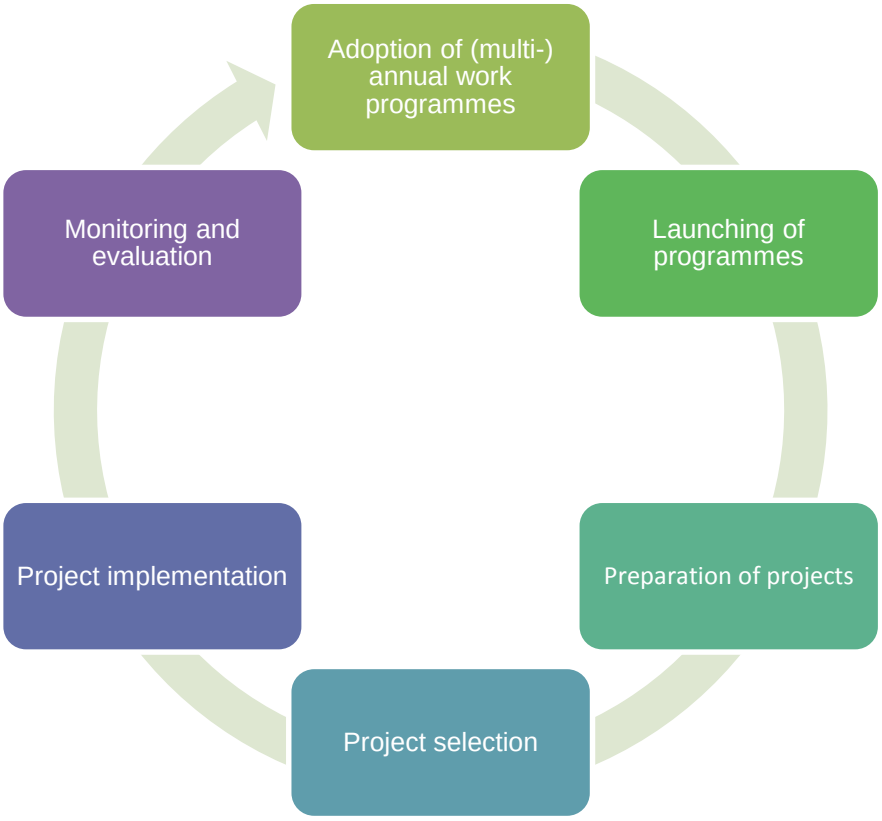


Source: own development building on Withana et al. 2014[113]

In contrast, the budget of those funds which are under central management is managed directly by the Commission services. Figure 2.3 presents the various stages of a typical policy cycle for these **centrally managed funds** (e.g. LIFE, Horizon 2020 and CEF). For these funds (multi-)annual work programmes are generally adopted by the Commission, which serve as strategic documents establishing the priorities and objectives of the funds. Once these work programmes are agreed the programme can be launched and the project preparation can start, where relevant. The final step is the monitoring and evaluation of the programmes.

113 Withana, S., Baldock, D., Illés, A., Rayment, M., and Medarova-Bergstrom, K., (2014) Tracking system for climate expenditure in the post-2013 EU budget: Making it operational, Final summary report for the European Commission - DG CLIMA, Institute for European Environmental Policy, London/Brussels., https://ieep.eu/uploads/articles/attachments/0bb118cf-6553-496c-9a38-3dc12252d0e8/Tracking_system_for_climate_expenditure_in_the_post-2013_EU_budget.pdf?v=63664509842

Figure 2.3: Stylised policy cycle of EU funds under central management



Source: own development building on Withana et al. 2014[114] and Milieu 2015[115]

Keeping the above in mind, we propose to distinguish between the following phases (which in practice often overlap) and structure our analysis along these lines:

- Decisions on horizontal mechanisms to be applied across the EU budget;
- Decisions on the policy priorities to be applied to individual programmes (including through negotiations on legislative texts); and
- Implementation of those policy priorities, including the detailed decisions on sectoral and programme mechanisms for climate mainstreaming.

2.4 Data collection and analysis

For each programme listed in section 2.1 we identified, assessed and summarised the key information on mainstreaming approaches and processes across the policy cycle, including: legislation underpinning the expenditure; programming, launching of programmes, preparation of applications, evaluation and selection, project implementation and monitoring and evaluation.

The nature of each programme, its objectives, political context, and mode of operation, is different; and we have tried to reflect the impact of those differences in our assessment, identifying the range of different approaches used under different management modes.

The analysis of climate mainstreaming in the focus areas identified in section 2.1 was complemented by a brief desk study of other areas of the EU budget. We identified **programmes with theoretical potential for a contribution to climate objectives** (see section3.3.4), **or which potentially conflicted with climate priorities** (see section 3.2.2); for each of which a brief desk review of relevant legislation and policy papers was carried out. Some of these programmes already report against the 20 % target for spending on climate priorities, but could potentially do more; others do not.

114 Ibid.
115 Milieu (2015) Study on climate mainstreaming in the programming of centrally managed EU funds, https://ec.europa.eu/clima/sites/clima/files/budget/docs/ml-04-15-741-en.pdf

2.5 Development of options for improvement

Drawing on the analysis of the climate mainstreaming approaches in the current MFF, and in particular the problem areas requiring improvement, **a number of options were developed for future consideration.**

The performance of each of the options was evaluated against a consistent set of criteria. These were:

- Effectiveness – in addressing the underlying problem areas
- Efficiency – including the cost/effort involved compared to the potential benefits
- Feasibility – of implementation in practice (in terms of technical feasibility and political acceptance)
- Coherence – between the different elements of the budget, and with wider EU policy objectives.

Following the evaluation of the individual sub-options, the most promising options were then grouped together into an overall package of recommended improvements.

3 Analysis of existing approaches and processes of mainstreaming in EU instruments

This section presents the results of our analysis of the existing approaches to climate mainstreaming in EU programmes.

The specific objectives of the analysis were to:

1) Assess how climate mainstreaming is promoted horizontally and in all concerned EU programmes, including:
    a. Approaches and processes of mainstreaming in the key instruments in terms of programming, commitments, and expenditure;
    b. Role of specific mainstreaming targets;
    c. Role of relevant management modes;
    d. Integration of mainstreaming into legal acts.
2) Make comparison with mainstreaming approaches used by other institutions, including the approaches used by the EIB.
3) Identify strengths and weaknesses with the current EU approach, including potential overlaps and divergences.

3.1 Decisions on horizontal mechanisms and tools

This section addresses a number of horizontal mechanisms for climate mainstreaming, applying across either the whole MFF, or across a range of programmes.

3.1.1 The political commitment to climate mainstreaming, including the 20 % target

In February 2013 the European Council reached an agreement on the outline of the 2014-2020 EU Multiannual Financial Framework (MFF) and decided that:

> **"The optimal achievement of objectives in some policy areas depends on the mainstreaming of priorities such as environmental protection into a range of instruments in other policy areas. Climate action objectives will represent at least 20 % of EU spending in the period 2014-2020** and therefore be reflected in the appropriate instruments to ensure that they contribute to strengthen energy security, building a low-carbon, resource efficient and climate resilient economy that will enhance Europe's competitiveness and create more and greener jobs."[116]

With this decision a two-fold commitment was made: first that climate change should be mainstreamed into all relevant EU programmes, and second that EU expenditure on climate objectives should amount to at least 20 % of the total EU budget.

In this annex, we focus on the former commitment, and examine the extent to which there was a horizontal process in the Commission for identifying priorities for climate-integration, and the programmes which were best placed to make an effective contribution. With regards to the latter commitment, Annex 3 addresses the tracking of budgetary inputs towards the overall 20 % target, through the monitoring of the contribution of each programme. There is some overlap between the commitments, since tracking of climate expenditure itself has impacts on mainstreaming; therefore in section 3.1.2 we assess the impact of the tracking exercise on climate mainstreaming.

The Commission's approach to mainstreaming, as has been pointed out by the European Court of Auditors[117], does not entail a mechanism for determining which funding instruments could contribute,

116 European Council 7/8 February 2013 Conclusions, Multiannual Financial Framework. EUCO 37/13 (emphasis added)
117 ECA (2016) Special report no. 1, 2016 "Spending at least one euro in every five from the EU budget on climate action: ambitious work underway, but at serious risk of falling short". European Court of Auditors., http://www.eca.europa.eu/Lists/ECADocuments/SR16_31/SR_CLIMATE_EN.pdf

and to what extent. The Financial Regulation (No 966/2012)[118], for example, does not mention climate mainstreaming, either in the preamble or in its operative provisions. Council Regulation 1 311/2013, laying down the Multiannual Financial Framework for the period 2014-2020[119], is also silent on the matter. To some extent, this reflects the reality that the Commission has to work with, in that individual funding instruments are subject to negotiation under different Treaty bases with different policy objectives and implementation mechanisms, with different policymaking communities playing a role before decisions are taken by the co-legislators. It would be difficult for an overarching approach to exercise an influence over that legislative process, either through a direct legal effect, or through an informal influence. However, **the absence of a coordinating mechanism on climate mainstreaming at the stage of the development of proposals within the Commission suggests that the approach in the current MFF is based largely on an expected response to the overarching political commitment of the European Council and Parliament**, with relatively limited mechanisms, other than mid-term reviews of the individual programmes, for addressing a shortfall should one emerge in practice. However, one **option for consideration** in future MFFs would be a prior identification by the Commission of the potential for expenditure on climate priorities in the different programmes making up its proposals, together with an identification of the expected impact on delivery of climate objectives (in terms of GHG emissions avoided, against a clear baseline, and in terms of improved resilience).

The 20 % headline objective, which the Commission considers as a political objective rather than a budgetary target, is itself a horizontal climate mainstreaming tool, as, even in the absence of a coordinated process determining which programmes should contribute what to its achievement, it sends a strong signal to all EU funds to consider climate objectives. The added value of the target as signalling to private investors has been also underlined in the Interim report of the High-Level Expert Group (HLEG) on Sustainable Finance[120], who called for an increase in the target from the current level. **The target seems to have acted as a driving force to better integrate climate change objectives in the EU programmes, and in particular played an important role for those funds which are under shared management** (e.g. the introduction of climate-relevant thematic objectives, ex ante conditionalities – see more in section 3.1.3); although as Annex 3 points out, it may also have an impact on choices between measures. In principle this allows decision-makers within each programme to identify the most effective ways of meeting the climate objective, although in practice it places a lot of importance on ensuring that climate-tracking methodologies are accurate. In the case of ESI Funds, the target also seems to have acted as a driving force for Member State authorities to consider climate actions in a more coherent way. However in some cases for adaption measures, this does not seem always to have led to a full impact in practice; the COWI (2017)[121] study which assessed the extent to which adaptation is integrated into the shared management funds found that while climate adaptation objectives appear at the strategic level in Pas, Ops and RDPs in some cases this is not translated into actual actions on the ground.

The target **does not set separate objectives for climate mitigation and adaptation actions**; an approach which is therefore reflected in the tracking methodology (see more in Annex 3 and below). This seems to limit the potential to ensure the integration of mitigation and adaptation objectives in line with the needs associated with expenditure areas, and makes it more difficult to link climate inputs to specific impacts. While the introduction of separate targets would potentially increase the administrative burden and may therefore require further assessment, an **option** for the Commission as an initial step towards this long-term approach could be the identification of those EU funds which would benefit from having separate mitigation and adaptation targets (for example. If a fund is found to focus largely on mitigation actions, and does not exploit its full potential to deliver adaptation outcomes, the introduction of separate targets could ensure greater focus on adaptation).

The current mainstreaming target should be reached by the end of the current MFF, by 2020, and as such it is aligned with the EU's Europe 2020 Strategy and the 2020 climate targets. As for the post-

118 Regulation (EU, Euratom) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, Euratom) No 1605/2002, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2012.298.01.0001.01.ENG

119 Council Regulation 1311/2013, laying down the multiannual financial framework for the period 2014-2020, http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32013R1311&from=HU

120 EU HLG on Sustainable Finance (2017) Financing a Sustainable European Economy, https://ec.europa.eu/info/publications/170713-sustainable-finance-report_en

121 COWI (2017) Mainstreaming of adaptation into ESIF 2014-2020, https://ec.europa.eu/clima/sites/clima/files/budget/docs/report_maindtreaming_adaptation_en.pdf

2020 MFF and its climate mainstreaming target, it will be important to reflect on the EU's long-term climate objectives– the 2030 and 2050 climate targets – and to ensure that these are also aligned with the aims of the Paris Agreement. One **option for future consideration** is a more systematic identification of the potential EU added value of climate investments, particularly in enabling early investment in technologies or measures likely to be necessary to deliver longer-term EU mitigation objectives. This could help to ensure that the potential EU added value in accelerating deployment of the technologies that may be needed to achieve ambitious mitigation and adaptation objectives in the long-term are fully exploited. This could also send a strong signal for private investors, thereby creating greater leverage and impact for EU expenditure.

3.1 2 The tracking of climate-related EU expenditure

The methodology developed for tracking EU climate expenditure focuses mainly on ex ante tracking and proposes a staged approach and a differentiation between direct and indirect management modes (IEEP, 2014)[122]; more detail on the tracking of inputs is available in Annex 3 "Input Tracking". The method used adapts the OECD Rio markers[123] approach and categorises climate expenditure according to three categories of EU climate marker[124]:

- If the expenditure is regarded as **not contributing to climate objectives or the contribution is insignificant**, a 0 % marker is assigned;
- If the expenditure is considered to provide a **moderate contribution towards climate objectives** a 40 % marker is assigned;
- If the expenditure is considered to provide a **significant contribution towards climate change objectives** a 100 % marker is assigned.

Detailed decisions on the application of the climate markers have been made, and initial results reported. While the aggregate tracking figures can provide an indication of the success of climate mainstreaming the nature of the approaches adopted to tracking climate expenditure varies significantly, largely because of variations in the nature of the expenditure concerned.

While the headline objective seems to have acted as a driving force at the strategic level and supported climate mainstreaming objectives (see above) **the objective's impact on expenditure decisions is difficult to identify** as its translation into legislation also depended on a wide set of actors within the EU policymaking sphere. While its existence appears to have had some effect on individual programming decisions – and, for example, on the introduction of minimum climate spend requirements in a number of instruments (35 % climate spending under Horizon 2020; minimum low carbon spending requirements in ERDF, 30 % climate and environment spending in Rural Development Programmes; and the introduction of a LIFE climate action programme)– these seem to have been equally a response to political pressures in the policymaking communities concerned with those programmes (lead European Parliament Committee; relevant Council formation; sectoral stakeholders). While (in the absence of a counterfactual) firm conclusions cannot be drawn about the impact of the 20 % objective, it seems safe to conclude that the high level political commitment to mainstreaming set out in the Commission's initial proposal for the MFF, and the European Council's endorsement of it, had a broadly beneficial impact on increasing the emphasis on climate objectives, the 20 % objective has acted as a mechanism for demonstrating delivery of an increased climate emphasis, rather than having a direct and measurable impact on amounts spent.

122 Withana, S., Baldock, D., Illés, A., Rayment, M., and Medarova-Bergstrom, K., (2014) Tracking system for climate expenditure in the post-2013 EU budget: Making it operational, Final summary report for the European Commission - DG CLIMA, Institute for European Environmental Policy, London/Brussels., https://ieep.eu/uploads/articles/attachments/0bb118cf-6553-496c-9a38-3dc12252d0e8/Tracking_system_for_climate_expenditure_in_the_post-2013_EU_budget.pdf?v=63664509842

123 See OECD (2011), "Handbook on the OECD-DAC Climate Markers" (although note that the methodology was developed for tracking development assistance expenditure) https://www.oecd.org/dac/stats/48785310.pdf

124 Based on Recital 3 of the Commission Implementing Regulation EU No 215/2014 of 7 March 2014 laying down rules for implementing Regulation (EU) No 1303/2013 of the European Parliament and of the Council laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund with regard to methodologies for climate change support, the determination of milestones and targets in the performance framework and the nomenclature of categories of intervention for the European Structural and Investment Funds, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014R0215

Interviews with desk officers responsible for individual programmes confirm the absence of a formal coordinating process within the Commission to determine either (a) which programmes were best placed to make a significant contribution to the climate spending target; (b) the options for maximising the impact on delivery of climate objectives of the 20 % target; or (c) the actions likely to be necessary to ensure delivery of the target in the event of a shortfall in the early years of the MFF. This points to the need to put in place a Commission-wide process to identify priorities for climate expenditure in the post-2020 MFF (see more in section 4), which would ensure an iterative process likely to deliver an identifiable impact on amounts spent on climate objectives (assuming an overall climate spend objective is set at a level greater than that which would be achieved in the absence of such an objective).

3.1.3 Climate mainstreaming in shared management funds: the Common Provisions Regulation (CPR)

The 5 funds under shared management (the ESI Funds: ERDF, CF, ESF, EARDF, and EMFF) are governed by the overarching Common Provisions Regulation (CPR) (Regulation No1303/2013)[125] which lays down the broad approach to climate mainstreaming in the funds and provides details about the climate expenditure method. It sets an overarching aim "to deliver the Union strategy for smart, sustainable and inclusive growth" (as well as the Fund-specific missions pursuant to their Treaty-based objectives).

3.1.3.1 Article 8: Sustainable Development

Climate action is explicitly mentioned in Article 8 of the CPR, on sustainable development:

> "The Member States and the Commission shall ensure that environmental protection requirements, resource efficiency, **climate change mitigation and adaptation**, biodiversity, disaster resilience, and risk prevention and management are promoted in the preparation and implementation of Partnership Agreements and programmes."

While approaches to translate Article 8 and other horizontal principles into specific actions on the ground seem to be challenging for Member States at the strategic level the introduction of the article can serve as a driving force for climate objectives.

3.1.3.2 Partnership Agreements (PAs)

The process for programming expenditure includes **a requirement on Member States to prepare a Partnership Agreement setting out, at Member State level, the intended use of ESIF expenditure over the programme period**. The detailed requirements of the Partnership Agreement are set out in article 15 of the CPR, and include (i) an indication of expected results per thematic objective and (ii) an indicative allocation of support per fund per thematic objective, as well as a total indicative amount of support for climate objectives. They are also required to explain how the horizontal principle of sustainable development, established in Article 8 of the Common Provisions Regulation (see above), will be implemented.

The Partnership Agreements were in part informed by Commission position papers for each Member State, prepared in 2012 while the MFF legislation was still in the process of negotiation; and were adopted in the form of Commission decisions between February 2014 and October 2014.

While a detailed and comprehensive assessment of the impact of Partnership Agreements on the effectiveness climate mainstreaming into the programmes has yet to be carried out a review (COWI 2016)[126] of the PAs show that climate action is always explicitly mentioned in the description of the two climate-related thematic objectives (TOs), while references to climate-relevance are indicated for TO6. With regards to TO1, climate action is referred to in more than half of the PAs and in the case of TO1 and TO7 this amounts to less than half of the PAs (see more on TOs below). The comparison of the first drafts and final versions of the PAs by COWI (2016)[127] also showed an increase in focus on

125 Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013R1303

126 COWI (2016) Mainstreaming of climate action into ESI Funds, https://ec.europa.eu/clima/sites/clima/files/budget/docs/report_mainstreaming_of_climate_action_en.pdf

127 Ibid

climate change considerations as a whole, suggesting successful intervention by Commission services. This positive impact was nevertheless mitigated by the delay in securing legislative agreement on the regulatory framework for the 2014-2020 MFF, which (by creating time pressure on the adoption of programmes), reduced the time available for full consideration of potential climate contributions.

A recent assessment of ESIF programming and climate mainstreaming in two Member States, Poland and Hungary, further suggests that the 2014-2020 Partnership Agreements have been influential in ensuring a greater degree of focus on climate objectives, and in integrating ESIF expenditure into national strategies more effectively than was the case in the 2007-2013 programming period (Nesbit, Paquel & Illes 2017)[128].

3.1.3.3 Thematic Objectives (TOs)

The CPR lays down a total of **eleven thematic objectives (TO)**, including two which are directly relevant to climate mitigation and adaptation:

- "Supporting the shift towards a low-carbon economy in all sectors" (TO 4) which is the only TO with 'thematic concentration', i.e. minimum earmarking of ERDF funds, and
- "Promoting climate change adaptation, risk prevention management" (TO 5).

In addition other thematic objectives can also contribute to climate-related investments, including TO1 "Strengthening research, technological development and innovation", TO3 "Enhancing the competitiveness of SMEs", TO 6 "Preserving and protecting the environment and promoting resource efficiency" and TO 7 "Promoting sustainable transport and removing bottlenecks in key network infrastructures. According to a recent study by COWI (2016)[129], which assessed the extent to which climate is mainstreamed into the ESI Funds, TO6 could deliver a significant amount of climate-relevant allocations (see Table 3-1).[130]

Table 3.1 Estimated share of all ESI Funds allocation to climate change by thematic objectives in the 2014-2020 programming period

Thematic Objective (TO)	Share of climate-relevant allocation (%)
TO1: Strengthening research, technological development and innovation	1.5
TO2: Enhancing access to, and use and quality of ICT	>0
TO3: Enhancing the competitiveness of SMEs	0.7
TO4: Supporting the shift towards a low-carbon economy in all sectors	34.3
TO5: Promoting climate change adaptation, risk prevention and management	6.5
TO6: Preserving and protecting the environment and promoting resource efficiency	42.4
TO7: Promoting sustainable transport and removing bottlenecks in key network infrastructures	9.7
TO8: Promoting sustainable and quality employment and	4.8

[128] Nesbit, Paquel & Illes (2017) Research for REGI Committee – Cohesion policy and Paris Agreement Targets , European Parliament, Policy Department for Structural and Cohesion Policies, Brussels, https://ieep.eu/uploads/articles/attachments/c6717f0c-98bc-4ede-a662-edd0ce418a8b/Cohesion%20Policy%20and%20Paris%20Agreement%20targets%20report.pdf?v=63667241874
[129] See footnote 24.
[130] At the same time, there are important caveats with regards to these estimates and in particular the reliability of the figures building on the tracking methodology, which are further detailed in Annex 3.

supporting labour mobility	
TO9: Promoting social inclusion combating poverty and any discrimination	
TO10: Investing in education, training and vocational training for skills and lifelong learning	
TO11: Enhancing institutional capacity and efficient public administration	0.1
Total	100

Source: COWI (2016)[131]

3.1.3.4 Ex ante conditionalities (ExAC)

In the 2014-2020 programming period ex ante conditionalities were also introduced with the aim of ensuring that national policy, regulatory and institutional frameworks within the Member States are fit for purpose and support the effective and long-term implementation of investments. The **ExAC set general and sector-specific and horizontal conditions which should be met by the MS by the end of 2016 the latest** (see Annex XI of the CPR).

For TO4, MS were required to carry out the following actions for ERDF and CF investments:

- "to promote cost-effective improvements of energy end use efficiency and cost-effective investment in energy efficiency when constructing or renovating buildings". In practice, this means that Member States are required to comply with key requirement of the Energy Performance of Buildings Directive (2010/31/EU)[132], the Energy Efficiency Directive (2012/27/EU)[133], and the Energy Services Directive (2006/32/EC)[134].
- "to promote high-efficiency co-generation of heat and power." In practice this means that Member States are required to comply with key requirements of Directive 2004/8/EC[135] on the promotion of cogeneration.
- "to promote the production and distribution of renewable energy sources." In practice this means that Member States are required to comply with key requirement of the Renewable Energy Directive (2009/28/EC)[136].

For TO5 the ExAC requires MS to put in place national and regional risk assessment, with the following elements:

- "a description of the process, methodology, methods, and non-sensitive data used for risk assessment as well as of the risk-based criteria for the prioritisation of investment;
- a description of single-risk and multi-risk scenarios;
- taking into account, where appropriate, national climate change adaptation strategies."

There is also an ExAC for ERDF investments in TO1 which can have implications on climate issues. Member States are required to have a national or regional smart specialisation strategy in place, which could include climate-related elements.

[131] Ibid.
[132] Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings, OJ L 153, 18.6.2010, p. 13–35, http://eur-lex.europa.eu/legal-content/en/ALL/?uri=celex:32010L0031
[133] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC, OJ L 315, 14.11.2012, p. 1–56, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2012.315.01.0001.01.ENG&toc=OJ:L:2012:315:TOC
[134] Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC, OJ L 114, 27.4.2006, p. 64–85, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32006L0032
[135] Directive 2004/8/EC of the European Parliament and of the Council of 11 February 2004 on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC, OJ L 52, 21.2.2004, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32004L0008
[136] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, OJ L 140, 5.6.2009, http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32009L0028

Furthermore, there is a general ExAC, which requires the existence of arrangements for the effective application of Union environmental legislation related to EIA and SEA. These include the following:

- "Arrangements for the effective application of Directive 2011/92/EU of the European Parliament and of the Council (EIA) and of Directive 2001/42/EC of the European Parliament and of the Council (SEA);
- Arrangements for training and dissemination of information for staff involved in the implementation of the EIA and SEA Directives;
- Arrangements to ensure sufficient administrative capacity".

A recent assessment by ICF and Metis (2016)[137] point out that the application of ExAC has already "helped identify situations in which relevant regulatory, institutional or strategic preconditions for effective intervention had not been met at the time of programme adoption. They have encouraged Member States to put in place necessary remedial actions and mobilise resources needed to address these issues". This creates a potential to support climate mainstreaming in general. At the same time, according to COWI (2017)[138] the MS progress on complying with the TO5 specific ExAC has been slow and thus it might not have reached its full potential to support the mainstreaming of adaptation actions; nevertheless our assessment is that the use of ex ante conditionalities has accelerated implementation of climate-relevant legislation in Member States. The COWI study has suggested that "the adaptation part of the ex ante conditionality on risk assessment could be strengthened through an explicit legal requirement for national risk assessments to be based on national adaptation strategies and related climate vulnerability assessments to ensure that relevant adaptation challenges are identified as key challenges for the programming."

Given the potential continuing contribution that ExAC could make to climate mainstreaming **one option** for future consideration is the wider use of ex ante conditionalities related to climate change mitigation and adaptation actions. While this has the potential be an effective tool to support mainstreaming it can also bring in delay in the process of agreeing on the programme details and can put a substantial administrative burden on Member States. Further difficulties might arise from the need to ensure that ex ante conditionalities refer to specific legal bases on climate change.

3.1.3.5 Ex-ante assessments and Strategic Environmental Assessments (SEA)

Article 55 of the CPR establishes a set of requirements for **ex ante assessments of the ESIF programmes at the early stages of the programming period**. Member States are required to carry out these ex ante assessments in order to ensure the quality of the programmes and amongst others they are required to "incorporate, where appropriate, the requirements for **strategic environmental assessment** set out in Directive 2001/42/EC of the European Parliament and of the Council taking into account climate change mitigation needs". While climate mitigation needs are specifically mentioned adaptation actions are not considered. The need to strengthen the role of adaptation in the SEA as part of these early programming stage assessments was noted by COWI (2017)[139].

According to the SEA Directive[140] a strategic environmental assessment is required for all types of programmes "which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use and which set the framework for future development consent for projects listed in Annexes I and II to Directive 2011/92/EU15[141]", which in practice means that the majority of programmes funded by ESIF are subject to an SEA.

In order to support managing authorities to carry out these ex ante assessment the Commission produced a set of guidance documents for programmes supported by the Cohesion Policy[142], the

[137] ICF and Metis. (2016), The implementation of the provisions in relation to the ex ante conditionalities during the programming phase of the European Structural and Investment (ESI) Funds", http://ec.europa.eu/regional_policy/sources/policy/how/studies_integration/impl_exante_esif_report_en.pdf
[138] COWI (2017) Mainstreaming of adaptation into ESIF 2014-2020, https://ec.europa.eu/clima/sites/clima/files/budget/docs/report_maindtreaming_adaptation_en.pdf
[139] Ibid.
[140] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32001L0042
[141] Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32011L0092
[142] EC (2014) Monitoring and evaluation of Cohesion Policy, Guidance document on ex-ante evaluation, http://ec.europa.eu/regional_policy/sources/docoffic/2014/working/ex_ante_en.pdf

EAFRD[143] and the EMFF[144]. Furthermore, guidance[145] on how to integrate climate change and biodiversity into SEAs was produced by the Commission in 2013.

3.1.3.6 Common output indicators

In the 2014-2020 programming period a set of **newly established common output indicators** were also put in place some of which are directly relevant for climate change mitigation (e.g. additional capacity of renewable energy production (MW) and estimated annual decrease of GHG (tonnes of CO_{2eq}) under ERDF investments) and climate change adaptation (e.g. population benefitting from flood protection measures or population benefitting from forest fire protection measures under ERDF investments). The establishment of these indicators has helped to improve the monitoring framework and can serve as a tool to focus managing authorities' attention on climate outcomes.

3.1.4 Climate-proofing major projects

A **major project** supported by the ERDF and the Cohesion Fund is defined by Article 100 of the CPR as having a total eligible cost exceeding €50 million (or €75 million for projects under Thematic Objective 7). For these investments managing authorities are required to make available detailed information to the Commission. The information requirements, which among others include climate change aspects (see Box 3.1), are described in Article 2 and Annex II of the Commission Implementing Regulation (EU) 2015/207[146]. Furthermore, an EC guidance document[147] outlining the climate change related requirements for major projects in the 2014-2020 programming period is available.

Box 3.1: Climate change information requirements on major projects

The format of information requirements on major projects are detailed in Article 2 and Annex 2 of the Commission Implementing Regulation (EU) 2015/207. Section F8 of Annex 2 in particular list the specific information requirements on climate change considerations:

- Section F8.1: An explanation on how the project is expected to contribute to EU and national climate change targets needs to be provided.
- Section F8.2: Project developers are required to describe how climate change related risks, adaptation and mitigation considerations, and disaster resilience have been taken into consideration.
- Section F8.3: Finally, information on resilience to current and future climate variability should be provided.

In addition to the above, further information should be provided for instance on the selection criteria used to select the best option, which should reflect on the vulnerability and risk assessment (section D2.2), an assessment of the feasibility of the selected option (section D3) and details of the risk assessment and sensitivity analysis (section E3.1 and E3.3).

Source: Commission Implementing Regulation (EU) 2015/207

There are three key tools that support the integration of climate change considerations into the project development stages of major projects:

- A carbon footprint assessment used in the cost-benefit analysis (CBA);
- The use of carbon shadow prices also used in the CBA; and
- The preparation of a vulnerability and risk assessment.

[143] EC (2014) Getting the most from your RDP: Guidelines for the ex-ante evaluation of the RDPs 2014-2020, https://ec.europa.eu/agriculture/sites/agriculture/files/evaluation/guidelines/2014-2020-ex-ante_en.pdf
[144] EC (2014) Guidelines for the ex-ante evaluation of the 2104-2020 EMFF OPs, https://ec.europa.eu/fisheries/sites/fisheries/files/guidelines-ex-ante-evaluation-2014-2020-emff-ops_en.pdf
[145] EC (2013) Guidance on integrating climate change and biodiversity into Strategic Environmental Assessment, http://ec.europa.eu/environment/eia/pdf/SEA%20Guidance.pdf
146 Commission Implementing Regulation (EU) 2015/207 of 20 January 2015 laying down detailed rules implementing Regulation (EU) No 1303/2013 of the European Parliament and of the Council as regards the models for the progress report, submission of the information on a major project, the joint action plan, the implementation reports for the Investment for growth and jobs goal, the management declaration, the audit strategy, the audit opinion and the annual control report and the methodology for carrying out the cost-benefit analysis and pursuant to Regulation (EU) No 1299/2013 of the European Parliament and of the Council as regards the model for the implementation reports for the European territorial cooperation goal, http://ec.europa.eu/regional_policy/sources/tender/pdf/2016065/annex4.pdf
147 EC (2016) Climate Change and Major Projects: Outline of climate change related requirements and guidance for major projects in the 2014-2020 programming period, https://ec.europa.eu/clima/sites/clima/files/docs/major_projects_en.pdf

A **cost-benefit analysis** is required for all major projects supported by the ERDF and Cohesion Fund and as indicated above the quantification of greenhouse gas emissions plays an important part in this process. In 2014, a comprehensive guidance[148] on the CBA of Cohesion Policy supported investment projects was developed by the European Commission. The guidance gives an overview of the general principles (including the evaluation of GHG emissions) that need to be followed during the CBA and it also provides detailed guidance for a set of key sectors, such as transport, environment, energy, broadband, and research, development and innovation.

In order to integrate the climate change externalities deriving from the development of the major project into the economic appraisal of the CBA a **carbon footprint methodology** has been developed by the European Commission for managing authorities. This methodology is primarily based on the European Investment Bank's (EIB) method (see Box 3.2). The carbon footprint assessment includes six key steps, which essentially lead to the calculation of the relative emissions deriving from the project implementation:

- First, the boundaries of the project need to be defined as this will define how the different emissions will be calculated.
- Secondly, the carbon assessment period needs be defined.
- As a third step, a decision needs to be made on the emissions scopes to be included in the calculations. Scope 1 includes direct emissions arising within the project boundary (such as the result of industrial processes). Scope 2 covers indirect emissions from purchased electricity. Finally, scope 3 includes all other indirect emissions that cannot be controlled by the project.
- The following three steps are the actual emission calculations. First, the absolute project emissions are quantified which represent annual emissions for an average year of operation for the project. Secondly, the baseline emissions are quantified, which are those emissions that would have occurred in the absence of the project. Finally, the difference between the absolute and baseline emissions is calculated which gives the relative emissions of the project.

With the calculation of relative emissions project developer should rank the various options for project development and select the one which emit the least GHG emissions.

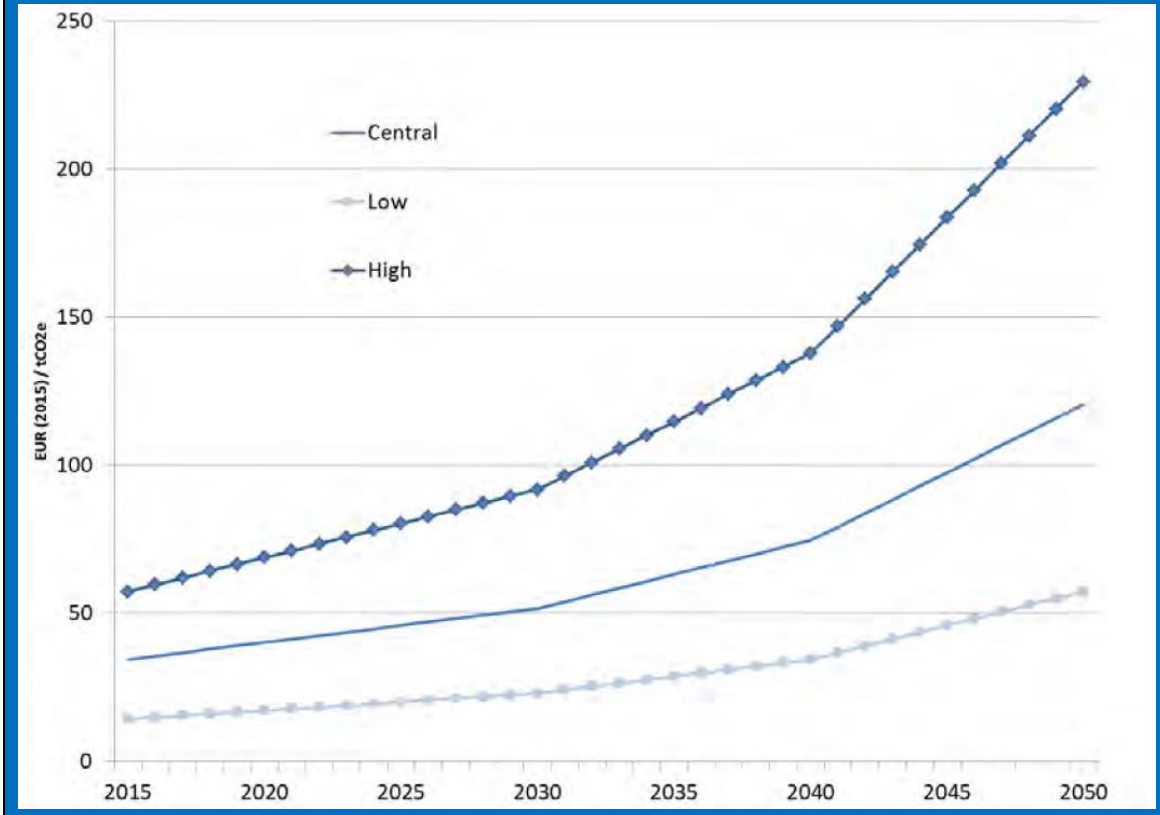
Another tool to integrate climate mitigation considerations into the project development cycle is the use of **carbon shadow prices**. The application of a carbon unit price for major projects is justified by the need to prefer low-carbon projects over carbon-intensive ones. The carbon shadow price used for the CBA for major projects is also based on the EIB methodology and calculations (see Box 3.2), which provides estimates for a carbon shadow price in the period of 2015-2050 in EUR per tonnes of CO_2-equivalent. The benefit of incorporating a shadow carbon price which reflects assumptions about higher demand for mitigation, and tighter constraints on GHG emissions, in the later years of a project's lifetime is that it can help to avoid supporting investments which appear to make financial sense at current carbon prices, but which are inconsistent with longer-term decarbonisation trajectories.

148 EC (2014) Guide to Cost-Benefit Analysis of Investment Projects: Economic appraisal tool for Cohesion Policy 2014-2020, http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/cba_guide.pdf

Box 3.2: The European Investment Bank's climate mainstreaming tools

The European Investment Bank (EIB) plays a leading role in mainstreaming climate objectives into large investments across Europe. While the EIB provides financial inputs to mitigation and adaptation projects – a minimum of 25 % of its financing is dedicated to climate action – it also integrates climate change considerations into all financed sector via its standards, methods and processes (see the Environmental and Social Principles and Standards[149]). Since 2007, the Bank has been incorporating a cost of carbon to its projects. The cost scenarios (see figure below) for the carbon unit costs have been recently updated and have been extended until 2050. In addition to the use of a carbon shadow price the bank also applies a GHG assessment in its CBA calculation chain and uses this tool to screen the projects' emission performance in power generation, to verify the emissions of hydropower and bio-energy projects and to strengthen the bank's overall portfolio reporting.

Figure 3.1: The carbon shadow price, EUR/t CO_2-eq in 2015 prices applied by the EIB



In addition to the above, the EIB also has specific sector lending policies. For instance, the energy lending criteria[150] includes an Emission Performance Standard (EPS) to the EIB's electricity generation projects in order to ensure that these are in line with the Member State's national GHG targets. Currently, the EPS is set at 550 gCO2/kWh. The transport lending policy[151] restricts lending to those projects that support the transformation of the transport sector into a more sustainable sector.

Source: EIB (2016) EIB Climate Strategy: Mobilising finance for the transition to low-carbon and climate-resilient economy

Finally, the mainstreaming of climate change adaptation considerations into major projects funded by the ERDF and Cohesion Fund is being done by the requirement to conduct a **vulnerability and risk assessment** for all major projects. The vulnerability analysis comprises of a sensitivity and an exposure analysis, while the risk assessment includes a likelihood and an impact analysis. The

[149] EIB (2009) The EIB Statement of Environmental and Social Principles and Standards, http://www.eib.org/attachments/strategies/eib_statement_esps_en.pdf
[150] EIB (2013) Energy Lending Criteria, http://www.eib.org/infocentre/publications/all/eib-energy-lending-criteria.htm
[151] EIB (2011) Transport Lending Policy, http://www.eib.org/infocentre/publications/all/eib-transport-lending-policy.htm

results of the assessment are used to identify and appraise various climate adaptation options and to help planning adaptation actions.

Building on the positive experience of having detailed guidance available for Managing Authorities on climate mainstreaming into major projects the Commission could consider extending these climate-relevant disciplines, such as the use of carbon shadow price or development of a vulnerability and risk assessment, for all investments funded by EU programmes. **One option** would be to evaluate how effectively these principles have been used by Managing Authorities for the ERDF and CF supported major projects and based on this analysis develop a set of **good practice principles for the use of CBA and vulnerability and risk assessment across all funds the post-2020 programming period**. The more extensive use of vulnerability and risk assessments seems to be particularly important as adaptation objectives appear to receive less attention compared to climate change mitigation. A recent assessment by the Directorate-General for International Cooperation and Development (DG DEVCO)[152] of the quality of environment and climate change mainstreaming in Action Documents showed that more attention needs to be paid on climate risks and that the use of tools supporting environmental and climate change analysis – such as SEAs and Climate Risk Assessments – needs to be improved. These findings are similar to those in section 3.1.3.5 on the role of SEAs in the ex ante assessment of ESIF programmes.

3.1.5 Guidance on climate mainstreaming provided by the Commission

A number of programmes – including the ESI Funds and those that are managed by DG DEVCO – produce guidance documents to support the preparation and implementation of the programmes..

This applies in particular to external action, with relative success in the case of the Development and Cooperation Instrument (DCI) (linked to an active process of identification of climate opportunities, see section 3.2.1.1) and with less success in the case of the European Neighbourhood Instrument (ENI) and the Instrument for Pre-Accession Assistance (IPA) (in both of which cases, reliance on partner countries, with lower political priority placed on climate issues, appears to limit the practical success of efforts to encourage mainstreaming).

In addition to the legal provisions (see section 3.1.3), extensive guidance on climate mainstreaming in the ESI Funds was also made available by the Commission: see for instance the guidance on major projects, for energy efficiency, renewable energy and smart grids, climate change adaptation, risk prevention and management[153]. These documents appear to be well-designed and effectively developed, and as such should in principle be useful for Managing Authorities within the Member States in supporting them to integrate climate considerations into their programmes.

While the guidance documents can serve as a useful tool to assist Member States to integrate climate considerations into their programmes we have not been able to assess the impact of the guidance on the ground as there are no readily available sources of information on how extensively these documents has been used by the Member States. In order to maximise the impact of such climate mainstreaming guidance future it could be useful for relevant line DGs to evaluate the extent to which their guidance has had a practical impact on programmes and projects, and build on the lessons learnt in the post-2020 programming period. In relation to adaptation actions in ESIF, a recent assessment by COWI (2017)[154] suggests that a continued support from the EC on knowledge and best practice examples is needed and thus further guidance might be useful in this area. The better use of good practice examples should be considered as an **option** for the post-2020 MFF.

[152] EC (2016) Integrating the environment and climate change into EU international cooperation and development. Tools and Methods Series Guidelines No 6.Directorate-General for International Cooperation and Development. February 2016. https://ec.europa.eu/europeaid/sites/devco/files/mainstreaming-guidelines-2016_en.pdf

153 DG REGIO, Guidance on European Structural and Investment Funds 2014-2020, Accessed: 11/07/2017 http://ec.europa.eu/regional_policy/index.cfm/en/information/legislation/guidance/ and DG CLIMA, Mainstreaming climate action into ESIF 2014-2020, Accessed: 27/07/2017, https://ec.europa.eu/clima/publications_en

[154] COWI (2017) Mainstreaming of adaptation into ESIF 2014-2020, https://ec.europa.eu/clima/sites/clima/files/budget/docs/report_maindtreaming_adaptation_en.pdf

3.1.6 Green public procurement (GPP)

According to the European Court of Auditors around 48 % of ESI Funds are spent through public procurement. While the national public procurement systems and practices vary widely across the Member States, the EU legal framework in this area builds on three directives:

- Directive 2014/24/EU of 26 February 2014 on public procurement (repealing Directive 2004/18/EC)
- Directive 2014/25/EU of 26 February 2014 on procurement by entities operating in the water, energy, transport and postal services sectors (repealing Directive 2004/17/EC)
- Directive 2014/23/EU of 26 February 2014 on the award of concession contracts

This last directive is a new addition to the EU legislation. The former two have been recently revised (the revised EU directives on public procurement were adopted in 2014 and the Member States had until 2016 to transpose them). The revision was intended to simplify the public procurement rules and also make them more flexible to accommodate the societal and environmental considerations. Directive 2014/24/EU[155] "clarifies how the contracting authorities can contribute to the protection of the environment and the promotion of sustainable development, whilst ensuring that they can obtain the best value for money for their contracts". The flexibility is enabled thanks to a new award criterion that, in contrast to the lowest price criterion, bases the award of contracts on the principle of the **'most economically advantageous tender' (the 'MEAT' criterion**). The MEAT criterion's goal is to help the contracting authorities to select the best value for money rather than the cheapest offer. The value in this context may include climate relevant indicators such as cost of GHG emissions (externality) or cost of energy (operating costs) in life-cycle costing.

The revision of the directives goes hand in hand with the Green Public Procurement (GPP) guidelines issued in 2016 by DG Environment[156], as well as **the relevant part of the Common Strategic Framework** (Section 5.2 of Annex I to the CPR). Green public procurement is a voluntary instrument that can also support the integration of climate change considerations into public procurement processes in Member States and thus can support climate mainstreaming in public sector decisions.

GPP is defined in the Commission's Communication (COM (2008) 400)[157] as "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured." It can bring a wide range of environmental benefits, including GHG savings and can set a good example for the general public and the private sector.

As of May 2017, 23 Member States have adopted a **National Action Plan** (NAP) or an equivalent strategic document on GPP.[158] These NAPs contain an assessment of the current national situation with regards to GPP and also set targets for the future. A number of initiatives[159] already exist in various cities across Europe; examples include the following:

- In Vienna an EcoBuy Programme has been in place to support GPP. This is considered to have led to savings of 100,000 tonnes of carbon emissions and €44.4 million cost saving between 2004 and 2007.
- In the Netherlands a national Sustainable Public Procurement criterion was developed. If all of the Dutch public authorities complied with this criterion 3 million tonnes of CO_2 emissions could be saved and the public sector's energy consumption could be reduced by 10 %.
- The city of Turku in Finland has adopted an environmental criterion for lighting and office equipment with which it is already saving GHG emissions. According to an estimate, if the

155 Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0024
DG ENV (2016), Buying Green! - A Handbook on green public procurement, http://ec.europa.eu/environment/gpp/buying_handbook_en.htm
157 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Public procurement for a better environment (COM/2008/0400 final)
158 DG ENV website on Green Public Procurement: http://ec.europa.eu/environment/gpp/index_en.htm [Accessed: 09/06/2017]
159 Ibid.

whole EU adopted the same criteria CO_2 emissions would be cut by 15 million tonnes per year in the EU.

In addition to the climate and environmental benefits (including resource efficiency considerations), GPP can also deliver broader social (e.g. health improvements) and economic (cost savings) benefits.

Public procurement relevant arrangements are also a part of the **ex ante conditionalities** set out in the Article 19 and Annex XI of the CPR. Member States are required to put in place the arrangements to ensure: (i) effective application of EU public procurement rules, (ii) transparent contract award criteria, (iii) training and dissemination of information for staff involved in the implementation of ESI funds, and (iv) administrative capacity for implementation and application of EU public procurement rules.

Despite what may seem an adequate framework to promote inclusion of climate considerations in the national public procurement and, as a result, enable further mainstreaming of climate action into the ESI Funds, the Member States often struggle to embed green public procurement considerations in the calls for services, goods, or works they issue. This is due to a number of causes (such as the complexity of applying the principles of equal treatment and non-discrimination, amplified by an error risk aversion[160]) and appears to be linked to more general weaknesses of public procurement practices under the ESI Funds. A recent study by PWC concluded that "procurement has been identified as a major source of deficiencies at audit, which can be attributed in large part to a **lack of sufficient administrative capacity** in terms of human resources, systems and tools, and governance structures"[161]. The study notes further that "specifically, many contracting authorities are wary of implementing concepts like MEAT criteria or GPP standards for fear of exposing themselves to legal appeals or audit sanctions." Finally, the study finds out that "ESI Funds management bodies feel they **lack sufficiently clear implementation rules and guidance from the EC** for the interpretation and application of the new Public Procurement Directives in the context of ESI Funds management".

Reluctance to use the GPP, and climate relevant criteria in particular, is partly due to the relative novelty of the revision of the EU public procurement rules; although the picture is not the same in all Member States. It is therefore difficult to formulate universally useful conclusions. Based on the PWC (2016) and ECA (2015) reports however, it is possible to envisage the following **options** for further improvement (see more in section 4):

- Member States could promote GPP, and a greater attention to the GHG footprint of the services or works they commission, by ensuring that the **contracting authorities in charge of ESI Funds distribution have access to adequate administrative capacity**. This could be done, among others, by making specialist training available to public procurement specialists. As with other training recommendations (below), this appears eligible for EU technical assistance support.
- Considering that ensuring sufficient administrative capacity is already part of the ex ante conditionalities set out in the CPR, the **practical link between the fulfilment of the ex ante conditionalities and payments to the Member States could be strengthened** – an option which was also suggested by the Commission in its recent Paper on the Future of EU Finances[162]. As suggested by ECA "If the ex ante conditionality concerning public procurement is not fulfilled by the end of 2016, the Commission should use its powers consistently to suspend payments to Member States concerned until they have rectified the shortcomings". The 2014 revision to EU public procurement directives came after the ESIF Regulations and is therefore not part of the ex ante conditionalities; but GPP is mentioned in

160 In their report on *goldplating* prepared in 2016 by the High Level Group monitoring simplification for beneficiaries of ESI Funds, Anna Lisa BONI and Pawel CHORĄŻY note that "zero-error and zero-fraud management rationale has been the main driver of all ESIF authorities and has had a big impact on beneficiaries in terms of an increasing complexity of the procedures and regulations to access and manage them". https://ec.europa.eu/futurium/en/system/files/ged/hlg_2016_0006_00_en_report_on_goldplating_from_rapporteurs.pdf , similar conclusion was made by the ECA (2015) in "Efforts to address problems with public procurement in EU cohesion expenditure should be intensified" report: "Authorities in the Member States
visited for this audit expressed concern about the risk that the new legislation will introduce certain new
elements of complexity, with the possibility of including award criteria and contract performance conditions
linked to social and environmental matters.". http://www.eca.europa.eu/Lists/ECADocuments/SR15_10/SR_PROCUREMENT_EN.pdf

161 PWC (2016), Stock-taking of administrative capacity, systems and practices across the EU to ensure the compliance and quality of public procurement involving European Structural and Investment (ESI) Funds, http://ec.europa.eu/regional_policy/en/newsroom/news/2016/04/14-04-2016-public-procurement-a-study-on-administrative-capacity-in-the-eu

162 EC (2017) White Paper on the Future of Europe, https://ec.europa.eu/commission/sites/beta-political/files/white_paper_on_the_future_of_europe_en.pdf

its Annex 1 as a mechanism for mainstreaming of sustainable development. Moreover, application of climate relevant criteria in public procurement procedures requires highly specialised (sectoral) training, including consistent and often complex methodologies which could build on the EU-level guidelines and good practice databases. The ways to preserve and update such knowledge within the national and regional institutions that manage ESI Funds is another element for consideration.

- The **European Commission could continue to support the necessary capacity building** in a more systematic manner (e.g. through greater emphasis on GPP in the main "Guidance for practitioners on the avoidance of the most common errors in projects funded by the European Structural and Investment Funds", promotion of good practices and methodologies for life cycle impact analysis, updates to the relevant guidance documents published before the adoption of the revised public procurement directives[163]) and/or in an ad hoc manner (e.g. by providing tailored technical advice to the Member States who seek it, following dialogue at the partnership agreement or the operational programming stages).

3.2 Decisions on programme priorities

3.2.1 Identifying and optimising positive climate potential for the delivery of climate objectives

The process for identifying positive potential for the delivery of climate objectives varies significantly between programmes. We address the impact of legislative minimum spend requirements for climate change in section 3.3.2 below, and here focus on decisions within programmes.

3.2.1.1 Active identification of potential climate opportunities

In the case of Horizon 2020, the Development and Cooperation Instrument (DCI), there has been a more active process of seeking out areas of climate focus and prioritising programmes and projects in those areas. Thus, Horizon 2020 has a number of areas of climate focus areas identified in its Strategic Programme, either of direct relevance (competitive low-carbon economy; energy efficiency) or of potentially significant relevance. These are the basis of individual work programmes, addressing specific objectives, which in turn either focus on climate policy issues directly (e.g. specific objective 12: Climate action, environment, resource efficiency and raw materials), or have significant potential to address climate objectives (for example specific objective 2: Future and emerging technologies, which identifies climate change in its work programme as being of particular relevance).

The DCI has a number of climate requirements written into its legislation (Regulation 236/2014), including a requirement for climate change screening on adoption of programmes (article 2), and a requirement to report annually including on the climate action expenditure. Its implementation involves the active use by Commission staff of guidance on the integration of environment and climate change into EU international cooperation and development, and training materials for Commission delegations in relevant countries.

In both cases, it should be noted that climate objectives are an important element in, or directly linked to, the rationale for the programme. Raising developing country awareness of, and willingness to address, climate mitigation and adaptation is an important element in EU development policy, and in EU diplomacy more broadly. And Horizon 2020 aims to direct expenditure to research areas where there is a clear European added-value, with climate change a shared issue that is central to European research ambitions. While similar potential prominence of climate issues could be identified in other areas of programmes expenditure, it is clear that the relevance of climate objectives is well understood in the wider policymaking community beyond the Commission services, and particularly among the relevant instances of co-legislator decision-making.

Addressing a relative lack of political relevance of climate objectives in other areas of the budget is likely to be challenging. However, an **option** is that by introducing specific elements of climate mainstreaming process, including reporting requirements, into draft legal instruments (rather than simply into the recitals) could provoke a discussion and improve the visibility of climate issues.

163 EC (2016), Public procurement guidance for practitioners, http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/guidance_public_proc_en.pdf

3.2.1.2 Detailed rules on programme implementation

A number of programmes, essentially the ESIF which are under shared management, **rely on an extensive system of rules specifying the approach to programming** and implementation. There is certain earmarking of funds for low-carbon investments (TO 4) from the ERDF (see above), but the broad approach adopted to mainstreaming means that climate-related investments can be found almost under all thematic objectives for the ERDF and CF. Furthermore, climate impacts and resilience is particularly looked for in major projects (see section 3.1.4). The CPR also sets ex ante conditionalities which promote the implementation of EU legal requirements on climate mitigation (for example, through the implementation of energy efficiency legislation – see section 3.1.3.4).

3.2.1.3 Limited process in some programmes

In some cases (notably CEF, COSME) there does not appear to be a significant effort to identify climate priorities; rather, the programmes allow for expenditure on a specified range of types of project delivering the objectives of the programmes, and climate-relevant projects are among those which then access those funds. In the case of COSME, Milieu[164] note that: "While the main objective [is] to support growth and competitiveness of EU enterprises, there are many ways in which this can simultaneously contribute to climate change objectives. Contributing to climate change mitigation through actions such as energy efficiency improvements, and enhancing resilience to climate change, can be critical components of improvements in the overall performance of enterprises." Milieu go on to note a number of areas where a greater focus on synergies with climate objectives could enhance climate outcomes.

In the case of CEF, the nature of the expenditure funded – preparatory work on Projects of Common Interest identified through the decision-making process of the EU's Trans-European Networks policy – means that there is already a significant inherent mainstreaming of climate objectives, since there are specific priorities under the CET-Transport and CEF-Energy areas of the programme related to decarbonisation of transport, and the integration of renewable sources of energy into the transmission network. However, there does not appear to be a further effort within the CEF programme to emphasise potential climate benefits either of these projects, or (potentially more interestingly) of projects under other priorities, such as the enhancement of rail interoperability, or interoperability of electricity and gas networks. Moreover, as Milieu note, there appears to be little attention paid to the climate adaptation importance of improving energy system and energy investment resilience to the potential impacts of climate change, including extreme weather events.

Similarly, and notwithstanding the high level of climate relevance of the programme, with a climate change service included in its products, Copernicus does not appear to have a specific process for identifying further potential for addressing climate change mitigation and adaptation priorities.

This could mean that in some areas of the budget, **the identification of specific climate objectives, and tracking of the 20 % commitment, may paradoxically limit the commitment to climate mainstreaming in other areas of the relevant programme** – as the climate objective is regarded as being met by the specific climate spending commitments. This reflects on the different nature of two types of climate expenditure: one of which is specific to climate objectives and is directly linked to climate-related investment needs (e.g. allocations for TO4 and TO 5 under the ESIF) and the other which supports climate mainstreaming more generally in other areas of the EU budget. If the percentage spending requirement is retained or strengthened, **an option** to address this risk could be by including specific reporting requirements on broader mainstreaming in the legal basis of relevant programmes.

3.2.1.4 Limited link between EU climate spending and EU and national climate policies

In order to maximise the impact of climate mainstreaming in the EU budget, it would clearly be beneficial to exploit synergies by ensuring **tangible links to relevant policies**, at both EU level, such as the Europe 2020 Strategy and its climate-relevant targets, and at national level, in developing policies to deliver EU-level targets.

One **option for consideration** is to establish a closer link between climate- expenditure within the EU budget and the future National Energy and Climate Plans (NECPs) under the currently negotiated

164 Milieu (2015), Study on climate mainstreaming in the programming of centrally managed EU funds, https://ec.europa.eu/clima/sites/clima/files/budget/docs/ml-04-15-741-en.pdf

Regulation on the Governance of the Energy Union[165]. The recent paper by Trinomics (2017)[166] found that there are significant data and knowledge gaps in terms of the Member State level information on domestic climate financing. Building on this, the EEA is now encouraging Member States to develop forward looking "national capital-raising plans"[167] which should be linked to the national climate and energy objectives. These plans could be integrated into the NECPs and as such would have the potential to identify a country's investment needs to reach its climate objectives (for the 2030 time horizon and beyond) and its plans to utilise domestic and EU-level public funding. The HLEG Sustainable Finance (2017)[168] has also called for this. The need to require Member States to clearly outline within their ESIF programming documents how their climate-related allocations contribute to the overall delivery of Member State climate mitigation targets was also suggested by Nesbit, Paquel and Illes (2017)[169].

In addition to mitigation targets a clear emphasis needs to be placed on better integration of the use of EU funds for adaptation actions into national adaptation policies, either via the (voluntary) National Adaptation Strategies or the NECPs. As indicated above in section 3.1.3.4, the greater use of national risk assessments could also be beneficial.

3.2.2 Identifying and managing potential negative impacts

Our analysis has largely focused on the process adopted in the Commission for identifying and securing positive climate impacts of expenditure within those EU programmes that are listed in section 2.1 and which cover 99.6 % of the total EU budget.[170] At the same time, **EU funds contributing to the climate mainstreaming target has the potential to invest in sectors which can have negative impacts on climate objectives**. Nevertheless, within this study there has been less focus on processes for identifying and managing negative impacts.

We noted some concern in reports and stakeholder commentary that some programmes, while mainstreaming climate through investment in specific areas, appeared not to pay sufficient attention to potential negative impacts in other areas of expenditure. For instance, the financial institutions NGO Bankwatch has criticised EFSI investment in its first year of operation for: "[leveraging] €1.5billion for fossil fuel infrastructure, and 68 % of transport investment is destined for carbon-intensive projects".[171] The balance of energy projects is an area where the fund has (and is) responding (via adjustments in EFSI 2). The umbrella NGO organisation CAN Europe (2017)[172] in its recent position paper indicated that "CEF still heavily supports fossil fuels. In its five calls for projects in the period 2014-2017 is allocating €1.1 billion of CEF funding to gas projects. This is more than twice as much as electricity interconnection projects have received so far. Furthermore, […] in some regions in Poland and Czech Republic households receive EU [Structural] funds to replace their old domestic coal boilers with newer coal combustion systems which is locking households into fossil fuel demand for decades. "

However, some of the horizontal tools identified in section 3.1 above, particularly the guidance on major projects, sector criteria, and the use of a shadow carbon price, have the potential to identify and correct such negative impacts (or, in the case of the shadow carbon price, favour investments which are less subject to them). The HLEG on Sustainable Finance has called for explicitly excluding fossil

[165] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the Governance of the Energy Union, amending Directive 94/22/EC, Directive 98/70/EC, Directive 2009/31/EC, Regulation (EC) No 663/2009, Regulation (EC) No 715/2009, Directive 2009/73/EC, Council Directive 2009/119/EC, Directive 2010/31/EU, Directive 2012/27/EU, Directive 2013/30/EU and Council Directive (EU) 2015/652 and repealing Regulation (EU) No 525/2013, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2016:759:REV1
[166] Trinomics (2017) Assessing the state-of-play of climate finance tracking in Europe, http://trinomics.eu/wp-content/uploads/2017/07/State-of-play-of-European-climate-finance-tracking-published-6-July-2017.pdf
[167] EEA (2017) Financing Europe's low carbon, climate resilient future, https://www.eea.europa.eu/themes/climate/financing-europe2019s-low-carbon-climate
[168] HLEG on Sustainable Finance (2017) Financing a sustainable European economy, https://ec.europa.eu/info/publications/170713-sustainable-finance-report_en
[169] Nesbit, Paquel & Illes (2017) Research for REGI Committee – Cohesion policy and Paris Agreement Targets , European Parliament, Policy Department for Structural and Cohesion Policies, Brussels, https://ieep.eu/uploads/articles/attachments/c6717f0c-98bc-4ede-a662-edd0ce418a8b/Cohesion%20Policy%20and%20Paris%20Agreement%20targets%20report.pdf?v=63667241874
[170] Our focus in this project has been on those areas of the European budget which are explicitly identified as contributing to climate objective and those which have a limited impact on climate objectives were not in scope (see more in Annex 1).
171 CEE Bankwatch (2016), The best laid plans - Why the Investment Plan for Europe does not drive the sustainable energy transition, https://bankwatch.org/publications/best-laid-plans-why-investment-plan-europe-does-not-drive-sustainable-energy-transition
[172] CAN Europe (2017) Position paper on the EU budget post-2020, http://www.caneurope.org/docman/fossil-fuel-subsidies-1/3081-can-europe-position-on-the-eu-budget-post-2020/file

fuels and other unsustainable projects from EU budget financing in the next MFF[173], which may have further benefits as a signal for private investors to shift their funds.

In order to minimise these potential negative impacts a further **option for consideration** is the introduction of sector investment guidelines and standards for the post-2020 EU budget. These could establish rules and identify those areas where EU funding should not be provided (e.g. no support for air transport), except if there is an exceptional case where the investment demonstrably reinforces climate mitigation objectives. As such, the EIB sectoral guidelines (see section 3.1.4) can serve as a useful practice example.

3.3 Decisions on programme implementation

3.3.1 Differentiation of approaches between central management and shared management programmes

There are two principal modes relied on for management of EU expenditure: central management, and shared management. In general, expenditure under central management appears to have much greater flexibility in how climate objectives are addressed (in some cases, but not always, constrained by specific targets introduced in its underpinning legislation, such as the 35 % target for climate expenditure under Horizon 2020); whereas shared management programmes have more detailed mechanisms for ensuring consistent compliance with the mainstreaming objectives at Member State and regional level.

3.3.1.1 Central management

Programmes under central management we have examined show a range of approaches to implementation of climate mainstreaming, depending in part on the extent to which **climate priorities are built in to the aims of expenditure ex ante, or emerge from the selection of projects**. Approaches adopted include the integration of climate considerations in programming documents (Horizon 2020; IPA II for example), or identification of specific areas of climate expenditure through calls for applications. Further detail on specific approaches to mainstreaming is provided under other headings, and it is difficult to generalise about the approach adopted. However, **in general there is a tendency for less detailed systems and procedures to be put in place**, with less precision on those procedures written into the legislative basis for each programme. This appropriately reflects the lower need in centrally managed programmes to ensure consistency of approach across Member States and regions, but appears to be accompanied in some areas (CEF, Horizon 2020) by a tendency to focus on climate only in those areas of the budget which are explicitly concerned with climate mitigation. While the more detailed approaches used under shared management (see section 3.3.1.2 below) creates a certain level of administrative burden both within Commission and in Member States, it has the benefit of forcing a dialogue about issues such as climate mainstreaming. Mechanisms to ensure a similar level of attention to mainstreaming in central management are considered below as **an option for future consideration** in section 3.3.1.3.

3.3.1.2 Shared management

As presented in section 3.1.3, the five funds under shared management (ERDF, CF, ESF, EAFRD, and EMFF) are governed by **the Common Provisions Regulation (CPR) which creates detailed rules and mechanisms to support climate mainstreaming across all of the funds**. These include:

- The establishment of Partnership Agreements, in which Member States are required to set out amongst others their intended use of expenditure with indications on the thematic concentration of funding.
- The introduction of eleven thematic objectives, including two of which are directly relevant for climate (TO4 and TO5) and with additional ones that can also provide significant support for climate objectives.
- The introduction of ex ante conditionalities, including those which are specific to climate change mitigation and adaptation.

[173] HLEG on Sustainable Finance (2017) Financing a sustainable European economy, https://ec.europa.eu/info/publications/170713-sustainable-finance-report_en page 44

- The introduction of the horizontal principle on sustainable development.
- The use of ex ante assessments of programmes and the application of SEAs.
- The establishment of common output indicators, including those which are specific to climate change mitigation and adaptation.
- The establishment of minimum spends under the ERDF and the EAFRD.

While the translation and implementation of these approaches vary on the ground for the different funds and according to the circumstances of individual Member States, these detailed rules support the mainstreaming of climate objectives at a strategic level in a coherent way, and seem to act as an important driving force for action.

3.3.1.3 Comparison between shared management and central management approaches

Our conclusion from the comparison of approaches to mainstreaming in the implementation of programmes is that, paradoxically, **the Commission has found it easier to ensure follow-through on the headline commitment and legal requirements to climate mainstreaming for programmes under shared management.** This is because the delegation of responsibility to Member State and regional level is accompanied by a set of explicit mechanisms detailing the ways in which climate objectives should be addressed and discussions in the programming phase; such detailed mechanisms are largely lacking in centrally managed programmes, because there is less need for ensuring consistent decision-making (since one authority, the Commission, takes the decisions). This may, however, **lead to a situation where the level of focus on climate mainstreaming responds less to the inherent potential and opportunities, and more to the extent to which the stakeholder and policymaking community in the relevant sector cares about climate issues**.

To some extent this relative lack of focus on climate mainstreaming in some centrally managed programmes could be addressed at an early stage in the decision-making process for the next MFF through the approach recommended in paragraph 0 above (**option** for an early Commission identification of potential for climate expenditure), which should provoke debate on the broader climate issue in relation to each programme. A further mechanism would be to ensure regular reporting, not just on delivery of expenditure targets, but on mechanisms introduced to ensure mainstreaming, and on projects and investments where mainstreaming had been successfully achieved.

3.3.2 Level of detail of the mainstreaming methodologies

There is a broad range of approaches to the detail specified in climate mainstreaming methodologies. While the European Structural and Investment Funds, and Horizon 2020, have developed detailed approaches to the programming of climate-relevant actions; others (e.g. LIFE) have introduced methods for giving greater weight to environment and climate criteria in project selection; and yet others (e.g. CEF and Copernicus) have largely limited themselves to the development of mechanisms for tracking climate expenditure (see Annex 3 for more details). To a large extent, this difference in approach reflects the different levels of climate relevance of programmes (see, for example Annex 5, Table 4-1); but it may also be influenced by the extent to which decision-makers (including the co-legislators) pay attention to the climate mainstreaming objective in their work.

One mechanism adopted in a number of programmes has been the **identification of minimum levels of spend on climate objectives**. This can either apply at the programme level, or (particularly for shared management programmes) in the rules relating to individual national or regional programmes. In the current programming period the following minimum climate spend requirements are in place:

- **Horizon 2020** includes a commitment to a minimum spend of 35 % on climate objectives;
- Minimum earmarking levels are established for low-carbon economy investments (for TO4), differentiated by the level of GDP per capita of each region (at least 20 % in more developed regions, 15 % in transition regions, and 12 % in less developed regions) for Operational Programmes under the **ERDF**;
- The allocation of a specific share of the **LIFE** budget (25 %) to its Climate Action sub-programme can also be seen as, in effect, a minimum spend requirement;

- At least 25 % of the Global Public Goods and Challenges programme under the **DCI** is earmarked for climate change and environment.
- The **EAFRD** also includes a broader minimum spend requirement of 30 % of EU funding on a range of environment and climate measures.

Building on the experiences of those funds where a minimum level of climate spending is required, an **option** for the Commission to consider is whether to apply the earmarking of climate resources, or minimum spend requirements, more widely across programmes, and to include this in the proposed legislation for programmes.

3.3.3 Extent to which mainstreaming methodologies represent an increased climate focus

The level of perceived climate relevance of the different EU budget programmes at the beginning of the 2014-2020 MFF period differs significantly (see Annex 1). For many budget lines there is no specific approach to integrating climate change into their core policy objectives beyond purely recording the perceived climate-expenditure under the specific funds. Some expenditure areas – for example, LIFE; elements of the EAFRD – viewed themselves explicitly as contributing directly and explicitly to climate mitigation or adaptation objectives. For others, climate was less directly relevant to the existing policy debate. This in turn led to differences of approaches to tracking climate expenditure, as described in Annex 3, which was in some cases regarded as being a process of recording an existing objective (for example, the climate policy elements of cross-compliance under the EAGF), but in other cases (for example, H2020) involved a new impetus behind the delivery of climate objectives. **The incorporation of an analysis of the potential contribution to climate objectives in the methodology for programme – for example, in the SWOT analysis for ESIF programmes – appears to be an important element in enabling a considered assessment of how the climate contribution can be optimised (although it should be noted it does not guarantee such optimisation).**

In order to assess the extent to which mainstreaming is delivering an increased climate focus in the current programming period we compared the approaches taken in the various EU funds during the 2017-2013 and the 2014-2020 period, in particular the Cohesion Policy, the agriculture funds (EARDF and EAGF), LIFE (+) and the EU's research and innovation funds (FP7 and Horizon 2020).

3.3.3.1 Cohesion Policy

With the introduction of thematic objectives for all ESI Funds, in particular the climate-relevant TO 4 and TO5, and other legal requirements (see section 3.1.3), **climate change objectives have been much more explicitly mainstreamed into Cohesion Policy funds compared to the 2007-2013 programming period.** This more articulated focus also appeared through various guidance documents provided for managing authorities, for instance on major projects, thematic guidance fiches and other publications (see above).

According to the latest Commission estimates, climate-related investments in the previous programing period amounted to around 9.7 % of total EU27 Cohesion Policy funds. In comparison, in the current programming period it is estimated that climate support has increased to 16.2 % (around EUR 56.4 billion see Table 3-2). In the 2007-2013 period indirect support for climate objectives played a larger role, while in the current period this has changed. Climate mitigation objectives play a more important role in the 2014-2020 period than adaptation objectives nevertheless information on this issue is not readily available for the 2007-2013 programming period.

Table 3.2: Support for climate change objectives under the EU's Cohesion Policy 2014-2020 (M EUR)

Fund/Objective	Total support	Climate change support	**Total share for climate action**	Of which		
				Share for climate mitigation	**Share for climate adaptation**	**Share for additional supportive measures**
ERDF	187 469	35 807	19.1 %	15.9 %	1.6 %	1.7 %
Cohesion Fund	63 393	17 623	27.8 %	21.1 %	4.7 %	2.0 %
ESF	82 223	1 151	1.4 %	1.4 %	0 %	0 %
YEI	6 672	0	0 %	0 %	0 %	0 %
European Territorial Cooperation	9 192	1 894	20.6 %	11.2 %	4.7 %	4.8 %
TOTAL	**348 949**	**56 475**	**16.2 %**	**13.0 %**	**1.8 %**	**1.4 %**

Source: *own calculations drawing on COWI (2016)*[174]

In addition to the above objectives, the **level of EU co-financing** also has a potential impact on the way in which climate objectives are supported by the Cohesion Policy. Article 60 of the Common Provisions Regulation indicates that the ESIF co-financing rates, which refer to the contribution EU funding makes to the ESIF programmes and which is expressed as a percentage of the total programme cost, is specified by the Commission for each programme and is subject to a maximum threshold. The recent Reflection Paper on the Future of EU Finances[175], which followed the Commission's White Paper on the Future of Europe[176], suggests a number of options to reform the EU's Cohesion Policy after 2020, including the option to increase the level of national co-financing in Cohesion Policy investments "in order to better calibrate them for different countries and regions and increase ownership and responsibility." One **option for future consideration** is the differentiation of co-financing rates with the aim to incentivise projects which go beyond the minimum requirements on climate objectives. This could act as an incentive for ambitious action. Nevertheless, careful attention needs to be paid on establishing the right level of co-financing rates, as very high rates can also hinder the efficiency of spending. As Le Den et al. (2015)[177] showed in the ex-post evaluation of the 2007-2013 Cohesion Policy support for energy efficiency in public and private buildings, in some cases Member States were applying very high EU co-financing rates (even 100 %) to their energy efficiency investments (in particular for public buildings) in the previous programming period, which seemed to be an over-reaction to the difficulties managing authorities encountered at the initial phases of the programming period to absorb the funds. Furthermore, in the case of investments which have the potential to generate financial savings, such as for energy efficiency investments, the exclusive use of grant funding should be avoided, given the strong case for more extensive use of loans and other financial instruments. The extended use of financial instruments in the post-2020 MFF has been also re-iterated in the Reflection Paper on the Future of EU Finances[178].

174 COWI (2016) Mainstreaming of climate action into ESI Funds, https://ec.europa.eu/clima/sites/clima/files/budget/docs/report_mainstreaming_of_climate_action_en.pdf

175 EC (2017) Reflection Paper on the Future of EU Finances, https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

176 EC (2017) White Paper on the Future of Europe, https://ec.europa.eu/commission/sites/beta-political/files/white_paper_on_the_future_of_europe_en.pdf

177 - Le Den, X., Riviere, M., Lessmann, F., Herms, S., Nesbit, M., Paquel, K. and Illes A. (2015) Energy efficiency in public and residential buildings. Final report. Work Package 8. Ex post evaluation of Cohesion Policy Programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and Cohesion Fund (CF). A report for the European Commission by Ramboll and the Institute for European Environmental Policy, Brussels, October 2015, https://ieep.eu/uploads/articles/attachments/b02b70ac-11f7-4139-968e-51d35f347149/Ramboll_and_IEEP_2015_Energy_efficiency_in_public_and_residential_buildings_-_WP8_Final_Report.pdf?v=63664509926

178 EC (2017) White Paper on the Future of Europe, https://ec.europa.eu/commission/sites/beta-political/files/white_paper_on_the_future_of_europe_en.pdf

3.3.3.2 EAFRD

The approach to programming under the EAFRD relies on the same broad approach as the other Structural and Investment Funds, and includes a requirement for Rural Development Programmes to spend at least 30 % of their EAFRD contribution on a range of environment and climate measures[179]. However, this minimum requirement represents a relatively low level, in comparison with the average level of Member State expenditure on environment and climate measures in the 2007-2013 period; and includes measures which have relatively limited impact on the delivery of climate objectives (further commentary on the climate markers used for tracking EAFRD expenditure is included in Annex 3). Moreover, the opportunity was introduced in the 2014-2020 budgeting period for Member States to transfer funds from their EAFRD allocation to their Direct Payments budget under the EAGF (which has a lower potential to deliver climate objectives). While the former "agri-environment" measure was renamed "agri-environment-climate", and explicitly refers to contributions to climate objectives, this does not appear to have changed the range of actions fundable under the measure in practice. Some additional references to climate objectives have also been included in the farm investments measure; and the opportunity for creating mutual funds for (inter alia) climate resilience is also available). **On balance, however, the mainstreaming of climate objectives in practice does not seem to have increased significantly in the 2014-2020 period compared to the 2007-2013 period**, perhaps in part due to the political context created by the introduction of greening measures in the EAGF (see below). Member States appear in many cases appear to have taken the view that since Direct Payments are now (at least in principle) achieving some of the environment and climate objectives which were formerly the preserve of the EAFRD, they could focus Rural Development Programmes more on issues such as farm competitiveness.

3.3.3.3 EAGF

The EAGF does not have a mainstreaming methodology in quite the same way as most other programmes; the rules governing Direct Payment expenditure funded under the EAGF are established under co-decided legislation at the beginning of the period (with some limited potential for Member States to adapt these rules to reflect regional or national conditions).

The Commission's proposals for the 2014-2020 period included a commitment to improve the focus of Direct Payments on the delivery of climate and environmental objectives through the allocation of 30 % of the envelope for payments to "greening" requirements. This represents a clear political commitment to additional mainstreaming of climate objectives. However, there was little analysis[180] of the likely impact of the greening requirements on climate or other environmental objectives in quantitative terms; and the final set of rules agreed by the co-legislators was somewhat more flexible for Member States than proposed by the Commission. Furthermore, as the ECA (2016)[181] has pointed out around 64 % of beneficiaries of direct payments are exempted from greening requirements, which further constrains the potential for the greening requirement to support climate mainstreaming. In addition to these exemptions Buckwell et al. (2017)[182] also point out that greening has failed to deliver its full potential due to the Member States' and farmers' choices made for implementing the greening requirements.

In terms of the detailed application of the greening requirements, we have not been able to identify any guidance provided by the Commission to Member States or paying agencies on how to maximise environmental and climate outcomes through their decisions on the detailed application of greening; and the examples we have seen of information provided by paying agencies to farmers are focused

179 Regulation 1305/2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005, article 59 (6), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:347:0487:0548:en:PDF

180 One of the few by Ecorys, IEEP and Wageningen University (2016) points out that "In Pillar 1, the opportunities provided by the introduction of greening measures to establish a basic level of environmental management across EU farmland have not been fully used for a variety of reasons. The environmental and climate targets identified within the RDPs are low considering the scale of the challenges faced. However, there is evidence of much improved tailoring and targeting of measures to address environment and climate objectives in RDPs. Overall, this study indicates that there is still considerable room for improvement in designing approaches that use multiple measures and instruments across both Pillars in ways that are synergistic to achieve the outcomes required to address the CAP general objective 'sustainable use of natural resources and climate action'". (Ecorys, IEEP and Wageningen University (2016) Mapping and analysis of the implementation of the CAP", https://ec.europa.eu/agriculture/sites/agriculture/files/external-studies/2016/mapping-analysis-implementation-cap/fullrep_en.pdf)

181 ECA (2016) Special report no. 1, 2016 "Spending at least one euro in every five from the EU budget on climate action: ambitious work underway, but at serious risk of falling short". European Court of Auditors., http://www.eca.europa.eu/Lists/ECADocuments/SR16_31/SR_CLIMATE_EN.pdf

182 Buckwell, A., Matthews, A., Baldock, D. and Mathijs, E. (2017) CAP - Thinking Out of the Box: Further modernisation of the CAP – why, what and how?, RISE Foundation, http://www.risefoundation.eu/images/files/2017/2017_RISE_CAP_Full_Report.pdf

exclusively on ensuring legal compliance with the requirements, rather than on how some of the measures (for example, the choice of ecological focus areas) can maximise environment and climate outcomes.

Thus, **the greening measures introduced in the 2014-2020 programming period represent a clear increase in the political importance of climate objectives** (alongside wider environmental objectives) in the EAGF; **but there is little precision on the intended impact on climate outcomes**; and opportunities for maximising the climate and environment benefits through guidance (from Commission to Member States; and from paying agencies to farmers) do not appear to have been taken up.

3.3.3.4 The LIFE (+) Programme

The 2007-2013 LIFE+ Programme covered three sub-programmes: LIFE+ Nature and Biodiversity, LIFE+ Environment Policy and Governance, and LIFE+ Information and Communication. While climate change objectives were part of the Environment Policy and Governance sub-programme's 'Climate change principle objective' they played a smaller role compared to the current LIFE Programme.

In the 2014-2020 LIFE Programme a separate sub-programme was established for climate change, increasing the fund's climate focus. Alongside this action, 25 % of all LIFE funds were also ear-marked to the Climate Change sub-programme, which includes three priority areas: Climate Change Mitigation, Climate Change Adaptation and Climate Governance and Information.

Furthermore, LIFE funding now aims to maximise the potential of any synergies between biodiversity and climate spending. This is made explicit in the wording of the legislation (to contribute to mainstreaming across policy areas) (Article 14(a), 15(a)). As well, a policy tool implemented to achieve this is the LIFE integrated projects. These are designed to promote coordination between different stakeholders and across boundaries and different funding sources and develop synergies between environmental and / or climate actions.

3.3.3.5 The EU's research and innovation funds: FP7 and Horizon 2020

Climate change objectives are explicitly mainstreamed into the current research and innovation fund, Horizon 2020, via the societal challenges themes, where several themes are specifically dedicated to climate-related issues, including theme SC3 Secure, clean and efficient energy, SC4 Smart, green and integrated transport, and SC5 Climate action, environment, resource efficiency and raw materials. To a lesser extent, some of the funding of the excellent science pillar of Horizon 2020 can be spent on climate-relevant research, especially via the Future Emerging Technologies (FET) program.

The increased focus on societal challenges, including climate change, has already appeared in the Impact Assessment Accompanying the Communication from the Commission 'Horizon 2020 – The Framework Programme for Research and Innovation[183]. The Horizon 2020 regulation also sets a specific objective that "climate-related expenditure should exceed 35 % of the budget", i.e. EUR 27.51 billion out of the total budget of EUR 78.6 billion. Based on the annual expenditures adopted, estimated or programmed the 2018 draft budget documentation[184] estimated that the total climate-related allocations of H2020 in the whole 2014-2020 programming period would amount to EUR 16.4 billion, which is lower than the established minimum spend.

In contrast, the objectives and priority areas of the 2007-2013 research and innovation fund, the FP7 were very different compared to Horizon 2020. Environment, including climate change appeared as a priority area under the Cooperation specific programme. According to the ex-post evaluation of FP7[185], 494 contracts were signed under this priority area and support amounted to EUR 1.72 billion, which is only 3.8 % of the total budget of the 2007-2013 FP7. In addition to the Environment priority

183 SEC(2011) 1427 final, Impact Assessment Accompanying the Communication from the Commission 'Horizon 2020 - The Framework Programme for Research and Innovation'; Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020); Proposal for a Council Decision establishing the Specific Programme implementing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020);Proposal for a Council Regulation on the Research and Training Programme of the European Atomic Energy Community (2014-2018) contributing to the Horizon 2020 –The Framework Programme for Research and Innovation, http://ec.europa.eu/research/horizon2020/pdf/proposals/horizon_2020_impact_assessment_report.pdf

184 EC (2017) Draft general budget of the European Union for the financial year of 2018, Working Document I, Programme Statements of operational expenditure, http://ec.europa.eu/budget/library/biblio/documents/2018/DB2018_WD01_en.pdf

185 Ex-Post Evaluation of the Seventh Framework Programme, Commission Staff Working Document, SWD(2016) 2 final

area, the Energy priority area could also support climate change objectives and for this 374 agreement were signed with the amount of EUR 1.85 billion (around 4 % of total budget).

3.3.4 Identifying climate impacts of other areas of expenditure

Our focus in this project has been on those areas of the European budget which are explicitly identified as contributing to climate objective and those which have a limited impact on climate objectives were not in scope (see more in Annex 1).

In this section we identify several other areas of the budget which may have potential for positive synergies with climate policy. No negative impacts on climate outcomes have been identified in these areas; and we have not identified significant areas of expenditure, other than in the programmes covered in detail by this project, which have the potential for significant negative impacts.

3.3.4.1 Humanitarian aid

Budget for 2014-2020: €7.1 billion + support for the EU Aid Volunteers initiative (€147.9 million) and the Emergency Support Instrument (€198 million) for operations inside the EU

Climate contribution: the mid-term review of the MFF indicates that the Humanitarian aid is expected to provide €295 million to climate objectives, which is minor compared to overall contributions and the potentials for further mainstreaming.

Aim: to provide needs-based humanitarian assistance to the people hit by man-made and natural disasters with particular attention to the most vulnerable victims

Links to climate action: The European Commission's Humanitarian Aid and Civil Protection department (ECHO) is an important driver of international disaster risk reduction (DRR) activities. ECHO's disaster preparedness programmes (DIPECHO) in Asia, Latin America and the Caribbean support early-warning systems, public-awareness campaigns and other resilience-building measures[186]. EU humanitarian aid participates in the delivery of the "The post 2015 Hyogo Framework for Action: Managing risks to achieve resilience"[187] that recognises climate risks' serious impact on the economy, security and well-being of citizens and that "climate change is also a threat multiplier for instability, conflict and state fragility leading to migration and displacement, weak governance and geo-political instability". Moreover, the ECHO adopted a "resilience marker" approach to anchor resilience in all its humanitarian programmes[188]. The marker is structured around four criteria: (i) Analysis of hazards, threats, vulnerabilities and their causes; (ii) Risk-informed programming; (iii) Local capacity building (directly or in cooperation); and (iv) Longer-term strategies. These criteria reflect important quality indicators in the project assessment process.

3.3.4.2 Instrument contributing to Stability and Peace

Budget for 2014-2020: €2.3 billion

Climate contribution: there are no climate-relevant financial figures reported in the mid-term review of the MFF and thus we see potential for climate mainstreaming into this fund.

Aim: to support short and mid-term actions on conflict prevention, crisis response and peacebuilding around the world, and longer term-assistance to projects linked to global and trans-regional threats.

Links to climate action: IcSP supports projects in a wide array of areas including natural preparedness and response. For instance, one of the 200 currently managed IcSP projects provides a €18 million envelope to enhance social and economic stability in drought-affected communities in Ethiopia that faces the worst food and nutrition crisis in decades[189]. The support measures include reduction of vulnerabilities to future shocks and builds up climate resilience. No direct links between the IcSP explicit objectives or management rules and climate action could be found.

186 Lerch. M. (2017), Humanitarian aid – EP Factsheet, http://www.europarl.europa.eu/atyourservice/en/displayFtu.html?ftuId=FTU_6.3.2.html
187 EC (2014), "The post 2015 Hyogo Framework for Action: Managing risks to achieve resilience", COM(2014) 216 final, http://ec.europa.eu/echo/files/news/post_hyogo_managing_risks_en.pdf
188 ECHO (2014), "Resilience Marker – general guidance", http://ec.europa.eu/echo/files/policies/resilience/resilience_marker_guidance_en.pdf
189 Instrument Contributing to Stability and Peace, Available at: https://icsp.insightonconflict.org/

3.3.4.3 Youth Employment Initiative (YEI)

Budget for 2014-2020: €6.5 billion (which include €3.2 billion from the ESF, but this assessment focuses solely on the non-ESF component of YEI)

Climate contribution: there are no climate-relevant financial figures reported in the mid-term review of the MFF and thus we see potential for climate mainstreaming into this fund.

Aim: to provide support to young people living in the regions where youth unemployment was higher than 25 % in 2012.

Links to climate action: The YEI is implemented in accordance with the ESF rules. The climate mainstreaming approach under YEI mirrors therefore that under the ESF with the exception that Member States are not required to use the climate-relevant secondary theme which is used by the ESF. Nevertheless, it is suggested that the same approach should be used, as the YEI also has the potential to support climate objectives.

3.3.4.4 COSME

Budget for 2014-2020: €2.3 billion

Climate contribution: In total €163.2 million is estimated in the mid-term review of the MFF to be allocated for climate objectives nevertheless, there are further potentials for increasing climate contributions within COSME.

Aim: to support (i) better access to finance for SMEs, (ii) access to markets for SMEs, (iii) entrepreneurship, and (iv) more favourable conditions for business creation and growth

Links to climate action: EU programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) is implemented on the basis of Regulation (EU) No 1287/2013[1]. Article 4 of that regulation stipulates that COSME, in the achievement of its main aim (that is not directly linked to climate action), shall promote "the need of enterprises to adapt to a low-emission, climate-resilient, resource- and energy-efficient economy". Moreover, as part of the COSME programme, the Enterprise Europe Network initiative "may include provision of measures to increase SME access to energy efficiency, climate and environmental expertise". Finally, the annual monitoring report drawn up by the Commission shall include "information on the amount of climate-related expenditure and the impact of support to climate-change objectives" (Article 15). COSME contains therefore direct links to the EU 20 % climate mainstreaming objective, and is expected to support its achievement through support to "development of sustainable products, services, technologies and processes, as well as resource- and energy-efficiency and corporate social responsibility" (preamble to the Regulation (EU) No 1287/2013). A recent study published by the Commission[2] indicates that, based on an ex ante tracking, climate action finance constituted around 7-8 % of the COSME's budget in 2014, 2015 and 2016. It notes further that "climate mainstreaming could be enhanced in COSME by building the climate awareness – on issues such as SMEs and adaptation (…)" but also by improved tracking of climate action support within COSME's financial instruments.

3.3.4.5 Erasmus +

Budget for 2014-2020: €14.7 billion

Climate contribution: there are no climate-relevant financial figures reported in the mid-term review of the MFF and thus we see potential for climate mainstreaming into this fund.

Aim: EU programme for education, training, youth and sport

Links to climate action: Erasmus + plays a major role in the implementation of the European Solidarity Corps initiative announced by President Juncker during the State of the Union speech in September 2016. The European Solidarity Corps will support European challenges by, among others, "rebuilding communities following natural disasters; addressing social challenges such as social exclusion, poverty, health and demographic challenges; or working on the reception and integration of

[1]Regulation (EU) No 1287/2013 of the European Parliament and of the Council of 11 December 2013 establishing a Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (COSME) (2014 - 2020) and repealing Decision No 1639/2006/EC, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R1287
[2] DG CLIMA (2015), "Study on climate mainstreaming in the programming of centrally managed EU funds", https://ec.europa.eu/clima/sites/clima/files/budget/docs/ml-04-15-741-en.pdf

refugees"[190] and also "clearing vegetation from forests to help prevent wildfires"[191]. The Corps will support therefore EU climate adaptation by addressing some of the most pressing direct impacts of climate change. Erasmus + supports also education programmes such as the European Masters in Climate Change and Restoration of Degraded Land (RECLAND). Nevertheless, there are no specific links to climate action stated in the Erasmus + work programme or Regulation (EU) No 1288/2013 establishing Erasmus +[192].

3.4 Key conclusions from the analysis

Following the review of the current climate mainstreaming approaches in the selected budget programmes of the EU MFF, the following headline conclusions can be drawn:

- Overall, **climate mainstreaming takes place at three stages within the EU MFF cycle**: (i) across the whole EU budget (via a set of horizontal mechanisms), (ii) at the level of the policy priorities of the specific funds, and (iii) at the level of programme implementation.
- There are a **wide set of tools that support horizontal mainstreaming**. These include: (i) the 20 % climate mainstreaming target, (ii) the climate expenditure tracking methodology, (iii) the Common Provisions Regulation and its rules for the five ESI Funds, (iv) the requirements to climate-proof major project supported by the ERDF and the CF, (v) guidance provided by the Commissions on climate mainstreaming, and (vi) green public procurement.
- **With the introduction of the 20 % high-level target for climate mainstreaming a two-fold commitment was made**: first that climate change should be mainstreamed into all EU programmes and second that EU expenditure on climate objectives should amount to at least 20 % of the total EU budget.
- There was **an absence of a coordinating mechanism on climate mainstreaming at the stage of the development of proposals within the Commission** which suggests that the approach in the current MFF is based largely on an expected response to the overarching political commitment of the European Council and Parliament, with relatively limited mechanisms for addressing a shortfall should one emerge in practice.
- Nevertheless, **the target seem to have acted as a driving force at the high-level in better integrating climate change considerations into the EU programmes**, and in particular played a role for those funds which are under shared management. At the same time, **the target's impact on expenditure decisions is difficult to identify** as its translation into legislation also depended on a wide set of actors within the EU policymaking sphere.
- As **the target does not differentiate between climate change mitigation and adaptation actions** there is a limited potential to enforce the integration of mitigation and adaptation objectives with an equal emphasis which can make the mainstreaming process less tangible.
- The current mainstreaming target should be reached by 2020. Nevertheless, **in the post-2020 MFF it will be important to reflect on the EU's long-term climate objectives**– the 2030 and 2050 climate targets – and to ensure that these are also aligned with the aims of the Paris Agreement.
- The **Common Provisions Regulation** includes a wide set of requirements which have the potential to support climate mainstreaming objectives. These include: (i) the requirements of Article 8 on sustainable development, (ii) the need to develop Partnership Agreements, (iii) the establishment of thematic objectives, (iv) the introduction of climate-related ex ante conditionalities, (v) ex ante assessments and Strategic Environmental Assessments, and (vi) newly established common output indicators.
- **Major projects supported by the ERDF and CF are subject to a cost-benefit analysis**, which considers a carbon footprint assessment and the use of carbon shadow prices, **and the preparation of vulnerability and risk assessments**. These tools can greatly support climate mainstreaming. The more extensive use of climate risk assessments have the potential to

190DG Education and Culture (2016) "2017 annual work programme for the implementation of 'Erasmus+': the Union Programme for Education, Training, Youth and Sport", https://ec.europa.eu/programmes/erasmus-plus/sites/erasmusplus/files/library/c-2017-705_en.pdf ,
191 https://europa.eu/youth/solidarity/faq_en
192 Regulation (EU) No 1288/2013 of the European Parliament and of the Council of 11 December 2013 establishing 'Erasmus+': the Union programme for education, training, youth and sport and repealing Decisions No 1719/2006/EC, No 1720/2006/EC and No 1298/2008/EC, OJ L 347, 20.12.2013, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013R1288

improve adaptation actions on the ground, which are in general lagging behind mitigation actions within the EU budget and in particular in the ESI Funds.

- The **full potential of green public procurement has not been reached yet** within the EU Member States, partly due to the relative novelty of the revision of the EU public procurement rules and as such due to the lack of administrative capacity in this field.
- **In the case of some EU funds** (e.g. the Horizon 2020 and the Development and Cooperation Instrument) there has **been a more active process of seeking out areas of climate focus** and prioritising programmes and projects than in others areas. **In contrast, in others** (notably in the CEF and COSME) **there does not appear to be a significant effort to identify climate priorities**; rather, the programmes allow for expenditure on a specified range of types of project delivering the objectives of the programmes, and climate-relevant projects are among those which then access those funds.
- In some areas of the budget, **the identification of specific climate objectives, and tracking of the 20 % commitment, may paradoxically limit the commitment to climate mainstreaming in other areas of the relevant programme** – as the climate objective is regarded as being met by the specific climate spending commitments.
- In order to have a meaningful impact of climate mainstreaming in the EU budget there must be **tangible links to relevant policies**, such as the Europe 2020 Strategy and its climate-relevant targets, as well as national climate policies. This is an area where progress seem to be limited and thus there is room for improvement.
- As **EU funds contributing to the climate mainstreaming target has the potential to invest in sectors which can have negative impacts on climate objectives** there is a need to identify and manage these impacts.
- It seems that **the Commission has found it easier to ensure follow-through on the headline commitment and legal requirements to climate mainstreaming for programmes under shared management** compared to those funds which are centrally managed**.**
- There is a broad range of approaches to the detail specified in climate mainstreaming methodologies. One mechanism adopted in a number of programmes has been the **identification of minimum levels of spend on climate objectives**.
- The **extent to which climate mainstreaming has increased climate focus within the current programming period in comparison to the 2007-2013 greatly differs between the various funds**. For instance, while climate change objectives have been much more explicitly mainstreamed into Cohesion Policy funds compared to the 2007-2013 programming period the mainstreaming of climate objectives in the Rural Development Programmes in practice does not seem to have increased significantly in the 2014-2020 period compared to the 2007-2013 period.
- In addition to the EU funds that have been examined within this study, **there are also other budget areas (e.g. humanitarian aid) that have the potential to support climate objectives**.

4 Options to improve EU approach to mainstreaming that could deliver system-wide greening of EU financing

Drawing on the analysis from the previous sections and our key conclusions above, we have developed potential options for improving the EU approach to mainstreaming that could deliver system-wide greening of EU financing. These are set out in the tables below, using a simplified structure which identifies, first, the **nature of the problem**; then the **possible option** identified; the intended **impact of the option** in terms of the effectiveness, efficiency and coherence of EU expenditure policy; and points for consideration in respect of the feasibility of the option, including any implementation risks that need to be addressed. Following the review of the individual options a package of options are recommended in section 4.2.

4.1 Problem definition and identification of options

The identified options are presented at the three levels where climate mainstreaming can take place: Table 4-1 presents the options identified at the horizontal level, Table 4-2 indicates the options at the level of programme priorities, and Table 4-3 shows the options we identified that can be applied at the level of programme implementation.

Table 4-1 Overview of problems and potential options – horizontal mechanisms

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
Horizontal mechanisms			
Lack of a process to ensure that the 20 % mainstreaming target is met; or that it is met with the most effective contribution to meeting climate objectives	Commission-wide process to identify priorities for climate expenditure, based on an analysis of which areas of the budget are capable of contributing most effectively to delivery of mitigation and adaptation targets, while also delivering on existing programme priorities.	Enhanced **effectiveness** of the 20 % climate target, and improved policy **coherence**. Should also help to improve **efficiency** (by avoiding distortion to programme priorities in areas which are less effective in delivering climate outcomes.	An exclusive focus on the € cost per tonne of emissions reduction, or € per increase in resilience, might not reflect the specific added value of the EU budget, or the need to improve attention to climate change in areas which have not yet prioritised it. We therefore recommend framing programme contributions in terms of the impact on the EU's long-term decarbonisation trajectory. One option could be, building on the current MFF, to develop a "traffic-light system" scoring of the various funds in which they would be ranked based on their potential to support climate objectives (bearing in mind their total budget, climate allocations and potential contribution to mitigation and adaptation objectives).

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
The current climate mainstreaming target does not set separate targets for climate mitigation and adaptation actions, which is also reflected in the current climate-expenditure tracking methodology.	Establishing separate mitigation and adaptation mainstreaming targets for the post-2020 MFF.	Enhanced **effectiveness** to mainstream mitigation and adaptation to the same extent. If aligned with the key EU mitigation and adaptation policies can also bring greater **coherence**. Given the potential increase in administrative burden **efficiency** is likely to be negatively impacted.	The feasibility of introducing separate mitigation and adaptation targets in the short-term is low given the administrative burden it could entail, and in particular the need to align this with the development of climate tracking methodologies. Nevertheless, as an initial step the Commission could identify those EU funds which would benefit of having separate mitigation and adaptation targets.
The current mainstreaming target focuses on the 2020 time horizon, and does not reflect the EU added value of a focus on investments needed to unlock mitigation needed for longer-term climate objectives.	Introduction of indicative climate mainstreaming targets which reflect on the EU's long-term climate objectives– the 2030 and 2050 climate targets – the Paris Agreement.	Greater long-term policy **coherence** and delivery of **EU added value** directing EU investment in the short-term into technologies that can serve ambitious climate objectives in the long-term.	The detailed implications of longer-term targets is more controversial than short-term targets, with different Member States placing different interpretations on EU commitments; this could make it more difficult to focus expenditure on delivery of longer-term mitigation.
Risk that the attention paid to tracking of the 20 % commitment may limit the focus on climate mainstreaming in other areas of each relevant programme.	Introduction of specific reporting requirements on broader mainstreaming in the legal basis of relevant programmes	Should contribute to **effectiveness** of climate mainstreaming by encouraging greater attention to lower-profile, but still relevant, mainstreaming opportunities; greater policy **coherence** between climate and programme objectives	Some administrative cost downsides; and risks that (except in cases where the sectoral stakeholder community is already engaged and interested) any reports would not be widely read. May be best to introduce the idea in a few policy areas initially, to judge broader applicability.
Potential negative impacts of EU investment on climate objectives is not mitigated consistently	Introduction of sector investment guidelines and standards for the post-2020 EU budget, which establish rules and identify those areas where EU funding should not be	Would deliver greater **coherence** across all EU investment and could increase **efficiency** of spending.	The introduction of the guidelines should follow an extensive analysis of the potential budgetary areas where negative impacts can occur. The guidelines could build on and be aligned with the EIB's sectoral lending

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
	provided.		principles and standards.
Climate-relevant ex ante conditionalities do not identify all potential climate-relevant requirements	Extended use of climate mitigation and adaptation relevant ex ante conditionalities	Should contribute to **effectiveness** of climate mainstreaming by ensuring basic requirements for investments. Given the potential increase in administrative burden, **efficiency** is likely to be negatively impacted.	While it has the potential be an effective tool to support mainstreaming it can also result in delay in the process of agreeing on programmes and can put a substantial administrative burden on Member States. It is suggested that a narrow set of additional key requirements are introduced which should be implemented rigorously.
Climate component of CBA and vulnerability and risk assessment is only applied in Cohesion Policy	Develop a set of good practice principles for the more extensive use of CBA and vulnerability and risk assessment across all funds for the post-2020 programming period.	Greater **coherence** across key investments in terms of mitigation and adaptation considerations.	Increase in administrative burden. The application of CBA and risk assessment under shared funds, where project level information is not required to be submitted to the EC (with the exception of major projects), would be difficult to enforce.
Co-financing rates (under ESIF) currently do not integrate climate considerations	Differentiation of co-financing rates with the aim to incentivise projects which go beyond the minimum requirements on climate objectives	Could deliver more **effective** climate action on the ground but a careful attention needs to be paid on establishing the right level of co-financing rates as very high rates can also hinder the **efficiency** of spending.	See risks noted in the text to the efficiency of spending.
Inconsistent use of opportunities presented by Green Public Procurement	Greater support to capacity building in Member States; and use of the ex ante conditionalities to encourage greater use of GPP.	The ex ante conditionalities focus primarily on legal compliance, rather than whether Member States are using the full potential available to them. Introducing GPP elements would represent a greater administrative burden; but could be accompanied by increased	Consultation with Member States and managing authorities on how to improve their capacity for using green public procurement mechanisms could help to ensure that progress is made without adding unnecessarily to administrative burdens.

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
		coherence and **efficiency** of expenditure in delivering climate outcomes.	
Lack of a widespread understanding among policymakers of potential for mainstreaming climate in programmes or projects	Better use of good practice examples both in terms of process (for example, effective guidance on mainstreaming used by DG DEVCO) and in terms of selection of projects and investments (for example, explicit weighting of climate impacts).	The **effectiveness** of tools such as guidance is linked not just to the quality of the guidance, but also to whether it is read and acted on. This in turn will depend on the broader political signals to which decision-makers are responding.	Development of tools to improve understanding should be accompanied by a Commission effort to ensure that climate issues become part of the wider political debate about expenditure instruments.

Table 4-2 Overview of problems and potential options – programme priorities

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
Programme priorities			
Limited link between EU spending priorities and EU and MS climate policies	Establish a closer link between climate - related spending in the EU budget and the future National Energy and Climate Plans (NECPs) under the currently negotiated Regulation on the Governance of the Energy Union.	Significantly enhanced **coherence** and **effectiveness** of spending but potential increase in administrative burden.	Guidance from the Commission to Member States will need to be provided and clear requirements should be set to limit the administrative burden.
	Establish a stronger link between allocations for mitigation actions and their contributions to the overall delivery of EU and MS climate objectives.		
	Establish a requirement to link adaptation allocations to National Adaptation Strategies.		

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
Difficulties in ensuring effective climate mainstreaming in some programme areas	Earmarking of climate resources, or minimum spend requirements, should be considered more widely across programmes, on a case by case basis, and included in legislative proposals where appropriate	Earmarking and minimum spend requirements are in theory likely to lead to less **efficient** spending (by reducing budgetary flexibility); but can in practice ensure greater **effectiveness,** and **coherence** with political priorities.	Earmarking is likely to be more effective in those programme areas where mainstreaming is less well embedded, or where there is inconsistent implementation of climate mainstreaming at Member State level.
Centrally managed funds have less detailed processes for integration of climate mainstreaming, leading to a lack of focus in areas of expenditure which are not labelled as climate relevant	Processes for centrally-managed funds which replicate some of the detailed programming rules for shared management programmes, or mirrors its benefits in terms of a broad consideration of climate impacts; for example, reporting requirements, or stakeholder dialogue on climate impacts.	A negative impact on **administrative cost;** but greater dialogue on climate impacts of expenditure should ensure both greater **coherence** of policy and expenditure, and greater **effectiveness** of expenditure in delivering climate objectives.	Processes introduced should be consistent with the Commission's formal status (all decisions of the Commission are decisions of the whole Commission), but allow for public and stakeholder challenge of whether climate opportunities are being fully exploited, and climate risks identified and mitigated.

Table 4-3 Overview of problems and potential options – programme implementation

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
Programme implementation			
Climate mainstreaming is not always linked to intended results	Greater clarity on what results climate-related expenditure is expected to deliver, and a process (see Annex 5) for monitoring delivery of those results.	Should achieve significantly enhanced **effectiveness** and **coherence**, through greater transparency over the budgetary process.	Requires close attention to the baselines for results, and an accurate and consistent system for monitoring.
Some expenditure areas make little use of guidance to encourage better integration of climate objectives in implementation decisions.	Best practice in the use of guidance (and in particular in the practical impacts on guidance) should be identified and promulgated; where implementation decisions can increase	Linked to the point above under "horizontal mechanisms". Guidance could help decisions-makers at the implementation level better integrate climate objectives in	The impact of more extensive guidance depends on the use of the guidance in practice.

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
	the effectiveness of delivery of climate objectives, clear guidance should be provided.	their decisions, ensuring greater **coherence.**	

4.2 Recommended package of options

Following the review of the individual options, the following options are recommended for further consideration by the Commission. These are grouped into two categories, the first are those which are relatively simple measures which can be implemented in the short-term. While recognising that the second group of options are more ambitious and in some cases can put increased administrative burden either on the Commission or the Member States we recommend that the Commission invest time into consider those as well, in particular in the longer-term, as they have the potential to bring EU added value to the mainstreaming process. The two sets of packages should be reviewed in view of the expected impacts and potential feasibility of the options as identified and explained in the tables above.

In the short-term:

- For the improvement of the overall climate mainstreaming process for the post-2020 MFF we suggest that the Commission considers the following two options:
    - The Commission should carry out an analysis of all EU programmes and identify those which are the most capable of delivering climate objectives. For this process we suggest the use of a traffic-light system, reflecting on the total budget of the programmes, the climate contributions, and their potential to deliver climate outputs in the short and the long-term. This analysis would lead to a Commission-wide process to identify priorities for climate expenditure in the post-2020 MFF and has the potential to significantly increase the coherence of climate mainstreaming and to actively encourage the integration of climate objectives into EU funds.
    - In order not to limit climate mainstreaming to direct climate allocations but to also encourage broader mainstreaming we suggest that specific reporting requirements should be introduced in the legal basis of relevant programmes on more general mainstreaming of climate into other investment areas. For the ESI Funds – similarly to the current framework - the potential for broader mainstreaming could be outlined in the Partnership Agreements, while detailed programme documentation could identify more specific contributions.
- Building on the suggestion of the Commission's Reflection Paper on the Future of EU Finances[193] we suggest to introduce a "single rule book" for similar types of investments which could include a set of tools to support climate mainstreaming in a horizontal way. Building on the wide range of tools available for the ESI Funds we suggest to introduce the following options to all EU investments:
    - Introduction of sector investment guidelines and standards for the post-2020 EU budget, which establish rules and identify those areas where EU funding should not be provided.
    - Establishment of a narrow set of key climate-relevant ex ante conditionalities for broader use within the post-2020 MFF. These conditionalities should be made relevant for the improved use of green public procurement as well.

[193] EC (2017) Reflection Paper on the Future of EU Finances, https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

- The more extensive use of climate considerations in CBA for EU investment decisions should be considered together with vulnerability and risk assessments (also see suggestion below on linking these to National Adaptation Strategies in the long-term).
- While the introduction of differentiated co-financing rates to incentivise ambitious climate allocations have the potential to improve climate mainstreaming across the whole budget a careful attention needs to be paid on establishing the right level of rates given that high EU co-financing levels can hinder the efficiency of spending.

In the long-term:

- The establishment of minimum spending requirements on climate objectives or earmarking of climate resources should be considered more extensively in the future MFF funding programmes on a case-by-case basis and should be include in the relevant fund-specific regulations, bearing in mind not to exceedingly constrain flexibility within the programmes.
- Drawing a closer link between EU climate allocations and EU and MS climate policies. Within the tables above we have identified three options to do this:
  - Creating a link to the National Energy and Climate Plans (NECPs) under the currently negotiated Regulation on the Governance of the Energy Union.
  - Establishing a stronger link between allocations for mitigation actions and their contributions to the overall delivery of EU and MS climate objectives. In the case of ESIF, these could be linked to the national GHG emission reduction targets.
  - Greater use of vulnerability and risk assessments and in particular creating a closer link between National Adaptation Strategies and EU allocations to adaptation objectives.
- Consider the establishment of separate climate mitigation and adaptation mainstreaming targets in order to ensure that attention is paid to both objectives. As a first step towards this long-term goal, the Commission could identify those EU funds which would benefit of having separate mitigation and adaptation targets (e.g. if a fund is found to focus largely on mitigation actions and does not exploit its potential in adaptation separate targets could reduce these imbalances).
- Finally, in order to ensure the path towards the long-term decarbonisation of EU spending the future MFF's climate mainstreaming target should be viewed in the context of various longer-term timeframes in order to reflect on the EU's 2030 and 2050 objectives, as well as the Paris agreement.

Finally, while this study has focused on the climate mainstreaming approaches used within the EU programmes we recognise the need to mainstream climate objectives into domestic public budgets within the EU Member States as well, in particular in view of their role in achieving the investment needs required to reach the EU climate policy objectives (see more in Annex 1). **The EU's approach to climate mainstreaming, and in particular its horizontal tools (see section 3.1), could serve as a good practice example for national authorities.** Furthermore, as recent studies showed that comprehensive domestic climate finance information – including investment needs and plans – is not readily available in most EU Member States and therefore domestic climate-expenditure tracking is very challenging (Trinomics 2017[194]; EEA 2017[195]) **the EU's climate tracking methodology (see more in Annex 3) could serve as a starting point for EU MS;** national authorities should consider adopting a similar approach, aligning their methodologies with the EU's climate markers in order to assist the delivery of a comprehensive and coherent picture of public climate-spending in the EU.

[194] Trinomics (2017) Assessing the state-of-play of climate finance tracking in Europe, http://trinomics.eu/wp-content/uploads/2017/07/State-of-play-of-European-climate-finance-tracking-published-6-July-2017.pdf
[195] EEA (2017) Financing Europe's low carbon, climate resilient future, https://www.eea.europa.eu/themes/climate/financing-europe2019s-low-carbon-climate

Annex 3: Input tracking

1 Introduction and objectives

1.1 Policy context

1.1.1 EU Energy and Climate commitments

The European Commission is looking at cost-efficient ways to make the European economy more climate-friendly and less energy consuming. Its low-carbon economy roadmap[196] suggests that by 2050, the EU should cut greenhouse gas emissions to 80 % below 1990 levels. Milestones to achieve this are 20 % emissions cuts by 2020[197], and 40 % by 2030[198]. Alongside these mitigation targets, the EU adaptation strategy helps to ensure that adaptation considerations are addressed in all relevant EU policies.

The delivery of the EU's climate objectives will require significant investment. At the time that the Europe 2020 Strategy was adopted, it was estimated that investment of ~€125 billion per annum would be needed to carry out climate mitigation actions across all sectors (including agriculture, buildings, energy, industry, transport, and waste). Further investment is also necessary for climate adaptation actions; and climate resilience needs to be built in to all long-term investments.

1.1.2 The Multiannual financial framework (MFF)

The multiannual financial framework (MFF) provides a framework for financial programming at the EU level. It lays down the maximum annual amounts ('ceilings') which the EU may spend in different political fields ('headings') over a period of at least 5 years. It also allows the EU to carry out common policies over a period that is long enough to make them effective. This long term vision is important for potential beneficiaries of EU funds, co-financing authorities as well as national treasuries.

With a view to responding to the challenges and investment needs related to climate action, the European Commission is implementing a mainstreaming methodology during the current (2014-2020) MFF including by aiming to make at least 20% of EU expenditure climate related.[199] The 'reflection paper on the future of EU finances'[200] published by the European Commission in late June 2017 further emphasises this aim to streamline and simplify the EU budget system in order to facilitate more efficient spending.

1.2 Objectives of the study

The objectives of this study are to provide a review of how the current (2014-2020) MFF arrangements for mainstreaming, and for tracking climate-related expenditure and its achievements, have operated in practice; and to make recommendations for potential options for improving the current processes.

1.2.1 Scope of the current report

As part of the study a review has been performed of the different approaches that have been taken to mainstream climate change issues into EU budget programmes and financial instruments, as well as the approaches to track climate expenditure (inputs) through budget programmes, the leverage of investment from financial instruments (outputs) as well as the overall effects of these investments on greenhouse gas emissions and climate adaption actions (results).

Separate reports have been prepared for each of the different elements of the review (mainstreaming, inputs, outputs, results), along with a further report assessing the investment needs associated with

[196] COM(2011) 112, A roadmap for moving to a competitive low carbon economy by 2050. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0112
[197] COM (2010) 639, Energy 2020. A strategy for competitive, sustainable and secure energy. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1409650806265&uri=CELEX:52010DC0639
[198] COM(2014) 15, A policy framework for climate and energy in the period from 2020 to 2030. Available at: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52014DC0015
[199] COM(2011) 500, A budget for Europe 2020. Available at http://eur-lex.europa.eu/resource.html?uri=cellar:d0e5c248-4e35-450f-8e30-3472afbc7a7e.0011.02/DOC_4&format=PDF
[200] COM(2017) 358, Reflection paper on the future of EU finances. Available at: https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

the EU's climate targets. This current report presents the findings from the review of approaches to track climate related expenditure in the EU budget.

2 Methodology

Our approach to the analysis of input tracking has involved the collection of information for each of the main programmes; this included information relating to the guidelines applied to the tracking of climate expenditure; the level at which markers for tracking climate-related expenditure are applied; the approach taken to implementing climate tracking in the relevant legislative acts or other instruments; and the current performance data reported.

The key source for the reporting of data on climate expenditure is the Commission's annual budgetary documentation, in particular the working document on programme statements of operational expenditure accompanying the draft general budget[201], and the statement of estimates for the financial year ahead[202]. Our analysis of the instruments and documentation on individual budget programmes complements this information, and provides context for it and background to how it is produced. The statement of estimates provides an indication of expected climate expenditure in the relevant year in the form of commitment appropriations (see Table 1, page 107 of the 2016 statement); the statements of operational expenditure, on the other hand, provided a more detailed explanation of the approach adopted to climate tracking under each line of the budget. A distinction to be borne in mind, however, is the difference between commitments and expenditure. We have focused primarily on commitments; although it will be important to identify any patterns in terms of the relationship between committed climate expenditure, and its conversion in due course into actual expenditure. While this ex post tracking, by definition, is of limited value in terms of improving the climate mainstreaming of expenditure under the current MFF, it may provide valuable lessons on the effectiveness of the 20 % target in driving mainstreaming in practice.

2.1 Definitions and methodological issues

Our analysis focuses primarily on committed expenditure, although the information we have gathered in relation to individual budget lines is not fully consistent – in large part, this reflects the difference in approach of each of the budget programmes (for example, an approach based on forward programming in relation to the ESIF, compared to an approach based on a predictable application of existing patterns of expenditure in the case of COSME and the EAGF).

2.2 Overview of existing approaches

The approach adopted by the Commission to the tracking of climate expenditure (and, where relevant, in the legislation underpinning different programmes) is based on an adaptation of the OECD Rio Markers approach.

2.2.1 The Rio Markers developed by the OECD

The Rio Markers approach was established in 1998, to track external development aid for climate mitigation, biodiversity and desertification aid. In 2009, an additional marker was created to capture flows for climate change adaptation. It was implemented in reporting on 2010 flows (OECD 2011).[203]

The key features of the Rio Markers approach are (OECD 2011)[204]:

- **Definition**: A definition is separately established for climate change mitigation and adaptation objectives. An activity is classified as climate change mitigation-related if "It contributes to the objective of stabilisation of greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system by promoting efforts to reduce or limit GHG emissions or to enhance GHG sequestration". An activity is considered climate change adaptation-relevant if "it intends to reduce the vulnerability of human or natural systems to the impacts of climate change and climate-related risks, by maintaining or increasing adaptive capacity and resilience".

[201] See for example COM (2016) 300
[202] See for example SEC (2016) 280
[203] OECD (2011) Handbook on the OECD DAC Climate markers, https://www.oecd.org/dac/stats/48785310.pdf
[204] Ibid.

- **Criteria for eligibility**: The identification of activities which contribute to the overarching objective.
- **Examples of typical activities** which are funded to contribute to the delivery of the environmental objective. For climate mitigation activities are identified at sectoral level, while for adaptation enabling activities are also listed.
- **Scoring system** Designed to identify cross-overs to avoid double counting of funds. What the OECD describes as a "scoring system" of three values is used, in which official development finance activities are screened and "marked" as either (i) targeting the UNFCC as a "principal" objective (score 2) or (ii) as a "significant" objective (score 1), or (iii) not targeting the UNFCC (score 0).

The OECD system further specifies the following guidelines for the application of the markers:

- Rio Marker 2: An activity can be marked as "principal" when the objective (climate change mitigation, climate change adaptation) is explicitly stated as fundamental in the design of, or the motivation for, the activity.
- Rio Marker 1: An activity can be marked as "significant" when the objective (climate change mitigation, climate change adaptation) is explicitly stated but is not the fundamental driver or motivation for undertaking and designing the activity.
- Rio Marker 0: Not targeted means that the activity was examined but found not to target the objective in any significant way.

2.2.2 Commission approach to climate markers

The EU's climate expenditure tracking methodology has been largely based on the OECD's Rio markers approach (see above), which was already used (and continues to be used) for reporting by the Commission in the area of external aid. For the 2014-2020 programming period a common EU climate expenditure tracking methodology was developed, which is now used for budgetary reporting. In order to adapt the Rio markers into quantifiable financial data at the level of programmes and funds the Commission applies a weighting system. As explained in the Commission's Statement of Estimates for the 2018 financial year[205]:

> "The climate tracking is done using EU climate markers, which adapted the OECD's development assistance tracking 'Rio markers' to provide for quantified financial data. EU climate markers reflect the specificities of each policy area, and assign three categories of weighting to activities on the basis of whether the support makes a significant (100 %), a moderate (40 %) or insignificant (0 %) contribution towards climate change objectives. At the same time, the tracking methodology has also reflected the specificities of policy areas."

While the climate markers are intended to be consistently applied for all EU funds the levels at which these markers can be assigned differ; in particular there are a number of differences in practice between funds under shared management and centrally managed funds. Section 4.2 below addresses these differences in more detail. In the case of the European Structural and Investment Funds, the detailed application of climate markers is set out in Commission Implementing Regulation 215/2014[206], which applies a slightly different approach to the objective-based approach which underlies the OECD methodology – as explained in its recitals:

> "The specific weighting assigned should be differentiated on the basis of whether the support makes a significant or a moderate contribution towards climate change objectives. Where the support does not contribute towards those objectives or the contribution is insignificant, a weighting of zero should be assigned."

[205] SEC(2017)250 - May 2017
[206] Commission Implementing Regulation (EU) No 215/2014 of 7 March 2014 laying down rules for implementing Regulation (EU) No 1303/2013 of the European Parliament and of the Council laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund with regard to methodologies for climate change support, the determination of milestones and targets in the performance framework and the nomenclature of categories of intervention for the European Structural and Investment Funds http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=uriserv%3AOJ.L_.2014.069.01.0065.01.ENG

Each year line DGs within the Commission prepare Programme Statements within which they provide a justification of the financial resources dedicated to the EU funds in terms of their objectives. These statements include financial figures in a similar format for each fund and also provide information on the EU added value and contributions to the Europe 2020 Strategy. For those funds which are considered to be relevant for climate action disaggregated financial figures on climate expenditure are provided at the level of relevant specific objectives. Furthermore, descriptive information is provided on the methodology that was used to track the reported figures.

2.3 Tracking ex ante climate-related expenditure

The methodology developed for tracking EU climate expenditure is primarily designed for ex ante application. It proposes a staged approach to tracking and highlights the need for different approaches according to the different management mode of the expenditure (IEEP, 2014)[207].

One potential risk of the EU markers approach identified by the authors of the 2014 study is that markers provide more accurate results when used on a wider, more detailed and granular, set of expenditure figures, as the inherent crudeness of estimation balances out better when applied over a wider range of data points. COWI, for example, note that different levels of detail apply in each funding instrument – thus, the ERDF has more than 100 investment categories compared to EAFRD which has 6, and of these, 2 carry a marker of 100 % (Union Priorities 4 and 5 for resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry). We identify below in section 4.2.2 the particular challenge of applying climate markers to EAGF expenditure, where a substantial budget is allocated ex ante, with effectively a single decision taken at the beginning of the MFF period in co-decided legislation; nuanced, necessarily subjective and therefore contestable, decisions about the application of the 100 % and 40 % markers have a significant impact on the reported total of EU climate expenditure.

The tracking methodology guidance has been applied in practice with a broad range of different approaches, reflecting the different nature and priorities of areas of expenditure; these approaches our outlined in the programme statements of operational expenditure accompanying the Commission's draft budget for 2018[208] . The mid-term review of the 2014-2020 MFF reported on the Commission's tracking of climate-related expenditure across the EU budget lines and provided data on commitment appropriations for the years 2014-2017 and estimates for 2018-2020. These are set out in Table 2-3.

Table 2-3 Climate Mainstreaming 2014-2020 – totals by programme

	Total climate allocations 2014-2020 (EUR million)	Climate as share of total commitment appropriations
HEADING 1a — COMPETITIVENESS FOR GROWTH AND JOBS	**29 508.3**	**20.76 %**
European Earth Observation Programme (Copernicus)	1 454.3	
Horizon 2020 – The Framework Programme for Research and Innovation	16 351.9	
Connecting Europe Facility (CEF)	11 538.9	
Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (COSME)	163.2	

[207] Withana, S., Baldock, D., Illés, A., Rayment, M., and Medarova-Bergstrom, K., (2014) Tracking system for climate expenditure in the post-2013 EU budget: Making it operational, Final summary report for the European Commission - DG CLIMA, Institute for European Environmental Policy, London/Brussels.
[208] COM(2017) 400, Working document Part I: Programme Statements of operational expenditure

	Total climate allocations 2014-2020 (EUR million)	Climate as share of total commitment appropriations
HEADING 1b — COHESION POLICY	**55 655.9**	**14.98 %**
European Regional Development Fund (ERDF)	36 851.1	
Cohesion Fund (CF)	17 998.9	
European Social Fund (ESF)	805.9	
HEADING 2 — SUSTAINABLE GROWTH: NATURAL RESOURCES	**106 131.3**	**25.27 %**
European Agricultural Guarantee Fund (EAGF)	46 249.0	
European Agricultural Fund for Rural Development (EAFRD)	57 260.0	
European Maritime and Fisheries Fund (EMFF)	1 011.0	
Programme for the Environment and Climate Action (LIFE)	1 611.3	
HEADING 3 — SECURITY AND CITIZENSHIP	**46.1**	**0.26 %**
Union Civil Protection Mechanism	46.1	
HEADING 4 — GLOBAL EUROPE	**8 783.2**	**13.26 %**
Union Civil Protection Mechanism	14.9	
Instrument for Pre-accession Assistance (IPA II)	1 586.7	
EU Aid Volunteers Initiative (EUAV)	9.6	
Instrument of financial support for encouraging the economic development of the Turkish Cypriot community	46.0	
European Neighbourhood Instrument (ENI)	1 888.7	
European Instrument for Democracy and Human Rights (EIDHR)	40.0	
Development Cooperation Instrument (DCI)	4 595.4	
Partnership instrument for cooperation with third countries (PI)	228.0	
Humanitarian Aid	307.5	

Source: Statement of Estimates for the Financial Year 2018 (SEC(2017)250 - May 2017), Annex III, Table 2. Denominator for share calculations taken from the staff working document accompanying the Mid-Term Review of the MFF (SWD(2016) 299 final), Annex 1

2.4 Known challenges of climate tracking in the EU budget

Our detailed analysis of programmes was informed by awareness of a number of specific challenges, based on the existing literature and familiarity with relevant programmes, and by the 2016 European Court of Auditors report "Spending at least one euro in every five from the EU budget on climate action"[209].

Where the EU climate markers have been applied, several difficulties have been encountered:

- Tracking methodologies used in the EU budget generally do not explicitly distinguish between adaptation and mitigation (with exceptions in the case of external aid spending, where the OECD system of markers is applied), and in many cases do not allow for such an identification ex post.
- Tracking methodologies do not monitor the potential of financial instruments intended to leverage funds: ex ante tracking of EU funds intended to leverage finance cannot track the full potential of the expenditure as they will by definition focus on the EU contribution, rather than on the additional finance potentially mobilised. This challenge is particularly relevant owing to the emphasis on financial instruments in the current budget cycle.
- There is a trade-off between developing a methodology which produces high quality data and one which is simple to use.
- Tracking methodologies thus far have focused mainly on tracking ex ante expenditure only.

In December 2016, European Court of Auditors published a detailed analysis of the EU spending against the Commission's 20 % target[210]. General observations and recommendations from the report relevant to the current project include the following:

> The ECA **observes** that "The established approach presents an inherent risk, since it focuses on identifying the plans for future expenditure. Planned expenditure on climate action does not, however, necessarily translate into actual spending." The Commission's response notes that the time delay between programming and expenditure means that expenditure data would not "provide useful information for improving mainstreaming", and states that because on average 97 % of budget commitments are realised, ex ante tracking is an efficient proxy for spending. However, it would be valuable to identify information on whether the expenditure realised is as focused on climate objectives as the expenditure planned; and whether there is any systematic pattern of either higher or lower expenditure on climate in practice; this would enable programme managers to make more realistic decisions on how to achieve 20 % of expenditure in practice, and would enable corrective action to be taken on any systematic problem in translating climate commitments into expenditure. Moreover, the 20 % policy objective refers to "20 % of spending" rather than 20 % of commitments or of planned expenditure, so it seems appropriate to ensure some means of tracking actual expenditure.
>
> The ECA **recommends** improved annual reporting on climate mainstreaming (which has largely been delivered through the Commission's annual budgetary documentation); and also **recommends** that "When planning the potential contribution to climate action from individual budget lines or funding instruments, the Commission should ensure that such plans are based on a realistic and robust assessment of the climate change needs and on each area's potential to contribute to the overall target." Tracking of expenditure could then be complemented by an assessment of the extent to which expenditure in practice reflects the needs identified ex ante The Commission's response notes that while it agrees with a consideration of climate change needs and the potential to contribute, it does not agree that specific contributions should be planned from each area or programme.

We have addressed relevant points from the ECA report, and the Commission's response to it, in the relevant sections of this Annex.

[209] ECA 2016
[210] European Court of Auditors (2016) Special Report 31: Spending at least one euro in every five from the EU budget on climate action

3 Data collection and analysis

For the programmes covered under this study, we have sought to identify, assess and summarise the key information on the current approaches to tracking climate related expenditure, including:

- the level at which the markers for tracking climate related expenditure are applied;
- approaches to integrate climate tracking into legislative acts or at other levels;
- current performance data i.e. climate expenditure;
- issues and challenges emerging in practice.

Table 3-1 below sets out in summary form our analysis of the tracking mechanisms we have examined.

Table 3-1 Climate tracking methodology in selected programmes

	2014-2020 total (EUR million)	Outline of tracking approach	Overall assessment	Comments on accuracy of estimation
ERDF/CF	55 083.7	Thematic objectives identified, including TO4 (supporting the shift towards a low-carbon economy) and TO5 (promoting climate change adaptation, risk prevention and management),. Operational programmes identify planned totals for all TOs[211] and then more disaggregated information on categories of intervention. Tracking of expenditure against those totals is carried out on the basis of the application of the 100/40/0 climate markers to 123 intervention codes, at the point when expenditure is committed and then monitored on an annual basis.	A sophisticated and detailed approach, appropriate overall given the flexible nature of ERDF/CF programmes, and the challenges of ensuring consistency. Some potential for separate identification of adaptation and mitigation, although some intervention codes could include both. Reporting is ex ante, based on commitments and ex-post based on expenditure. In addition to the voluntary 20 % objective for MSs, legal requirements, including for minimum earmarking of ERDF for TO4 (low-carbon economy), were introduced. There is scope for bias in programme allocation of investments to TO4. However, as MS exceeded by 50 % the minimum earmarking, this potential bias is unlikely to mean that expenditure in general was below the minimum requirements.	A single intervention code seems to be used for most investments; this is a possibly necessary simplification; but will lead to some over-reporting and some under-reporting. For example, innovation in large companies could include a significant energy efficiency component; but would be recorded at 0 %; investment at ports would be given a 40 % marker, but could (for example) include new facilities for fossil fuel imports. There may be scope for a sample ex post assessment to identify potential scale of under/over-estimation
ESF	1 133.3	Thematic objectives as for ERDF/CF;	A reasonable approach, given	Likely to be a broadly accurate reflection of

[211] It should be noted that climate related investments also occur in other TOs (e.g. TO1 R&I, TO3 SMEs, TO6 environmental protection and resource efficiency, TO7 transport infrastructure).

	2014-2020 total (EUR million)	Outline of tracking approach	Overall assessment	Comments on accuracy of estimation
		but given the nature of ESF investment (social and employment projects) a secondary theme "supporting the shift to a low-carbon, resource efficient economy" was introduced. Where programmes contribute to the secondary theme, for example through skills investments relevant to the low-carbon economy or adaptation, a 100 % marker is applied.	the likelihood that climate impacts will be relatively limited.	limited levels of investment.
EMFF	1 017.2	Thematic priorities are the basis for programming. Eligible measures set out in the regulation under the thematic priorities are the basis for application of the 100/40/0 climate markers.	A reasonable approach in principle, although with significant weaknesses in practice (see next column). Comprehensive revision of the EMFF markers to ensure that a conservative approach is applied is recommended. Good potential for separate identification of mitigation and adaptation inputs.	Some measures appear to have significantly higher markers applied than appears justified. For example, the regulation underpinning permanent cessation of fishing activities (100 %) makes no mention of climate change; and the measure has existed since 1999 without reference to climate objectives (although this does not preclude it having positive climate impacts). Similarly, some of the energy efficiency measures appear to have only a secondary climate relevance; and the investment in ports measure to have limited climate relevance.
EAFRD	57 231.0	Programming contributes to the 6 union priorities identified in regulation 1305/2013, each of which includes a number of sub-priorities, and which contribute in turn to the thematic objectives applying to all structural	A reasonable approach in principle, although the ECA[212] has identified concerns in practice. While the Commission comments that its approach aims to strike a balance	The ECA identifies concern over the inclusion of the "areas facing natural constraints" measure under a priority with a 100 % marker; while the Commission considers that its approach strikes a balance between reliability and

[212] European Court of Auditors (2016)

	2014-2020 total (EUR million)	Outline of tracking approach	Overall assessment	Comments on accuracy of estimation
		and investment funds. EU climate markers are applied at the level of the sub-priorities: measures permitted under the regulation are identified as contributing to specific sub-priorities. Thus, expenditure under a given measure is given the climate marker of the sub-priority to which that measure contributes.	between reliability and administrative burden, a more appropriately conservative approach to application of the 100 % marker could be chosen without any impact on administrative costs. Revision of the markers to ensure a conservative approach is recommended, perhaps based on ex post assessment of the climate impacts delivered by expenditure under the measures with climate markers. Good potential for separate identification of mitigation and adaptation inputs.	administrative burden, we share the ECA's concern. The measure compensates for "all or part of the additional costs and income foregone related to the constraints for agricultural production in the area concerned"; neither the measure itself nor the designation of the areas concerned addresses climate mitigation or adaptation. We recommend a detailed assessment of the climate results and relevance of measures in advance of future decisions on application of the climate markers.
EAGF	47 024.0	30 % of the Direct Payments budget is allocated to the 3 Greening requirements; these have climate markers applied at 100 % (permanent grassland), 40 % (ecological focus areas); and 0 % (crop diversification). For the remaining 70 % of direct payments, farms only need to achieve cross-compliance. The Commission uses a 40 % marker, on the basis that some of the legal requirements and Good Agricultural and Environmental Condition (GAEC) requirements have climate benefits; and then applies that 40 % marker to the 20 % potentially at risk to farmers from an initial failure to	Given the scale of EAGF expenditure, and the impact of decisions on applying climate markers to individual elements, it is questionable whether the 100/40/0 approach is sufficiently flexible to reflect the reality of expenditure. While we have some questions over the appropriateness of some markers chosen, we recognise the challenge of applying an accurate yet conservative approach. Our view (see next column) is that there is a degree of over-estimation in	Over-estimation occurs in at least two respects: (i) not all farms are required to comply with the greening requirements. Those which are organic, or which are below size thresholds, are not affected. While organic farms could be assumed to provide significant environmental benefits, and payments to them could thus have a 40 % marker applied, the total for smaller farms should arguably be excluded from the budget to which the markers are applied. (ii) Our understanding is that the total expenditure is reported before the application of financial discipline, a top-slice of payments reflecting budgetary shortfalls

	2014-2020 total (EUR million)	Outline of tracking approach	Overall assessment	Comments on accuracy of estimation
		comply. This leads to a 19.6 % average marker: 100 %*10 % = 10 % (permanent grassland) 40 %*10 % = 4 % (EFAs) 40 %*70 %*20 % = 5.6 % (cross-compliance)	the Commission's approach.	(egg because of temporary market intervention expenditure). The post financial discipline total should be used instead. There are also concerns about the markers chosen for cross-compliance, given that the bulk of the requirements are already legal obligations on farms. It is thus difficult to see how the relevant payments can be treated as delivery of climate objectives. The European Court of Auditors[213] suggested a more conservative approach of applying the 40 % marker to 10 % of the budget; the Commission disagreed. However, the cross-compliance marker could also arguably be applied to the 10 % of direct payments covered by the 0 % marker for crop diversification.
LIFE	1 628.1	LIFE climate action is assumed (logically) to contribute 100 % to climate objectives. LIFE environment is assessed on a project by project basis	A relatively conservative approach to LIFE environment (ECA notes a contrast with the treatment of similar non-climate environment objectives in the EAFRD). Some potential for separate identification of mitigation and adaptation inputs, although in many projects there appear to be both. Reporting appears to be ex ante, on approval of projects – an ex post assessment of	As with any application of the markers on the basis of a project-by-project judgement, ensuring consistency is likely to be challenging; although, provided any inconsistencies are not systematically biased towards under-reporting or over-reporting, this should not lead to a problem with the overall estimates at programme level. The scope of this project has not permitted a project-by-project analysis, but we would recommend this.

[213] European Court of Auditors (2016)

	2014-2020 total (EUR million)	Outline of tracking approach	Overall assessment	Comments on accuracy of estimation
			expenditure and impacts could be valuable.	
Horizon 2020	16 567.8	Rio markers are allocated at topic level for programmable actions; and at project level for bottom-up actions (i.e. where the nature and focus of projects is not predictable).	A broadly appropriate system designed for the nature of the programme. There is in principle good scope for separate identification of mitigation and adaptation, given the specific nature of the research questions addressed by H2020 projects. However, project by project assessment in bottom-up areas creates (according to Milieu[214]) problems of consistency; and there are concerns of inconsistent reporting by project officers.	Measures to ensure consistency of reporting for projects under bottom-up actions could be considered.
CEF	10 993.0	Assumes a 100 % contribution in relation to “new technologies and innovation for all modes of transport”, and a 40 % contribution for other projects (except road, rail noise, and secure parking areas). There is no project-by-project assessment of climate contributions.	A very simple system, which seems unlikely to be able to identify spending on the basis of the real climate impact of individual projects. Consideration should be given to a project-by-project approach, within maximum contributions similar to those currently applied to categories	Potential for either under-reporting or over-reporting of climate impacts, which could be better understood from a detailed project-by-project assessment. Improved project-by-project methodology could also focus greater attention on currently under-emphasised opportunities for integration of climate objectives (e.g. energy efficiency; resilience).

[214] Milieu, 2015

	2014-2020 total (EUR million)	Outline of tracking approach	Overall assessment	Comments on accuracy of estimation
			of project. Does not allow for mitigation and adaptation benefits to be distinguished, although in practice there appears to be little identification of expenditure on adaptation.	
Copernicus	1 454.4	Climate markers are applied at sentinel level within the Space Component of Copernicus expenditure, and at service level within the Services Component. Markers are applied by DG GROW on the basis of expert judgement. 100 % of the climate change service; 50 % of the atmosphere and marine environment monitoring service; and a 30 % contribution from data from sentinel satellites.	A relatively crude approach, but broadly appropriate to the nature of the programme. A clearer evidence base for decisions on markers might be valuable, however. Anomalous use of 30 % and 50 % markers does not appear to be consistent with the wider Commission approach to application; but is based on an assessment that 50 % and 30 % of the relevant expenditure is 100 % climate relevant.	No evidence identified of under- or over-reporting.
DCI	4 589.6	Climate markers are applied ex ante at project level to mitigation and adaptation; and appear to be defined on the basis of the OECD system, rather than the modified Commission system (not least because the Commission then needs to report the data to the OECD. Developed systems in place for quality control and consistency of marker use, including an annual quality control before data is submitted to the OECD DAB database. Commission also	A best practice approach to project-by-project assessment, addressing the challenge of ensuring consistency, and using climate tracking as a tool for wider climate mainstreaming. The incorporation of explicit targets for climate spending could in principle lead to some incentives for over-reporting, although we are aware of any suggestions that this has in fact	No identified issues of under- or over-reporting, as a result of the quality control mechanisms in place.

	2014-2020 total (EUR million)	Outline of tracking approach	Overall assessment	Comments on accuracy of estimation
		reports annually on climate action spending under the programme. Significant effort has been applied to the development of guidance and training materials for project officers.	occurred.	
IPA II	1 637.3	Climate markers are applied at the level of the operational programmes funded under ENI; and use the OECD methodology rather than the modified Commission methodology.	It is unclear whether climate expenditure reported at operational programme level reflects application of markers at the level of individual projects; this would appear to be the more accurate approach. Some concerns have been raised about the challenge of accurate allocation of markers in the absence of detailed information on expenditure content. Little evidence identified of efforts to ensure consistency in the application of the markers. Tracking is ex ante; and does not provide data enabling a breakdown between adaptation and mitigation spend.	Potential for both under- reporting and over-reporting as a result of a relatively simple application of markers at programme level; and as a result of limited advance information on the content of actions.
ENI	1 883.2	Similar approach to IPA II	As above	As above

.

4 Cross-cutting issues

4.1 Accurate presentation, and communicating the nature of the 20 % target

The TFEU art11, the COM mainstreaming approach, and the Commission's Budget Focused on Results initiative call for policy coherence and aim at ensuring that spending contributes simultaneously to several objectives. Nevertheless, presentation of budgetary information also needs to take into account the audience for that information; particularly when the presentation involves a high-profile policy commitment, such as climate mainstreaming, of interest to a wide range of stakeholders and members of the public. Statements which equate the 20 % to "spending on climate action", or "the climate share of the budget" risk giving the inaccurate impression that the funding is directly spent on explicitly climate mitigation and adaptation related projects – for example, improved flood management systems to deal with increased frequency of high rainfall events, or investment in renewable energy – rather than expenditure where the contribution to climate objectives is less central to the intervention logic.

It is implicit in an approach based on delivering multiple benefits from the EU budget that even where a 100 % climate marker is applied, the expenditure may also (indeed, should, wherever possible) contribute to other objectives. For example, the Commission considers that expenditure under rural development programmes on the areas facing natural constraints measure contributes 100 % towards climate objectives; however, this does not preclude a significant contribution being counted towards biodiversity objectives in respect of the same expenditure; and in any case by its nature the expenditure is first and foremost aimed towards delivering on the treaty objectives of the Common Agricultural Policy such as agricultural incomes. We note in section 4.6 below a number of instances where we think that the climate contribution of expenditure is over- or under-estimated, however. It is also important for data from tracking exercises to be presented accurately; for example, to make clear when presenting results of climate tracking and biodiversity tracking that the same expenditure is in some cases counted against both priorities, and to avoid cumulative presentation of the results. While the Commission avoids such cumulative presentation itself, there is a risk that stakeholders will assume that the expenditure concerned is separate, particularly as results of the biodiversity tracking exercise start to receive greater publicity, unless care is taken to ensure that the overlapping nature of the climate and biodiversity contributions is presented explicitly whenever either is described.

Moreover, beyond the question of accurate recording against the target as defined, there is clearly a risk that the nature of the 20 % objective will continue to be difficult to communicate to policymakers and the wider public. In particular, it should be noted that the existence of an objective of 20 % of EU expenditure being spend on climate action objectives, as measured in this way, is not comparable to a decision to allocate 20 % of the EU budget directly to specific climate action funds, such as LIFE Climate Action. We recommend that the largely symbolic nature of the expenditure target is made clearer, for example by expressing it as a commitment that "20 % of the EU budget will contribute towards climate objectives"; and that future financial frameworks aim to identify not just the climate contribution to climate objectives, but the (ideally quantifiable) impact expected from that contribution.

4.2 Typology of approaches

We have noted a range of different approaches to tracking of climate expenditure, based to some extent on the differing nature of the programmes, and particularly on the difference between centrally managed funds and funds under shared management.

4.2.1 Project-by-project assessment

Typically adopted for programmes, or parts of programmes, where the nature of the expenditure is potentially broad, and therefore the climate contribution can be expected to vary. This is the approach adopted by, the bottom-up elements of Horizon 2020, by LIFE Environment, and by the DCI. In most cases the assessment is applied **ex ante** – when the project is selected for funding – without an **ex post** assessment of the impact of the project in practice. Areas where an element of ex post assessment is incorporated include the DCI, where the objective appears to be primarily to ensure

consistency of approach. In response to observations on ex post monitoring in the ECA's report[215], the Commission commented that:

> "Calculations based on the actual payments would create additional administrative burden since the payments may last for years and may be subject to financial corrections"

While an ex post assessment of expenditure will, by its nature, not provide immediate information on current commitments, we recommend that the Commission considers the feasibility of carrying out such an analysis, potentially on a random sample basis (we understand that DG REGIO is already carrying out such an assessment for the funds for which it is responsible). This could identify whether there were any systematic differences between commitments to climate expenditure and the real nature of the projects as finally delivered (for example, were the elements of the project which led to a climate contribution being identified delivered in practice to the level expected? Is there a difference in the conversion of commitments into actual expenditure between climate projects and non-climate projects?). Moreover, the political commitment underpinning the 20 % target, the European Council conclusions of February 2013, is that "Climate action objectives will represent at least 20 % of EU *spending*" (emphasis added).

4.2.2 Ex ante determination of climate impact at programme or sub-programme level

Adopted by programmes (CAP Direct Payments under the EAGF, Copernicus) with highly predictable expenditure. Where there is limited prospect of expenditure priorities changing, and reasonable certainty that the expenditure will continue to deliver the identified climate policy impacts, this approach appears appropriate, provided a conservative approach is taken to the application of climate markers. It is less appropriate for project-based programmes (CEF, Horizon2020, LIFE, or the DCI) where a project-by-project assessment of climate impacts would better reflect the range of outcomes in practice.

However, as noted in section 2.3 above, the climate markers system is less appropriate for areas of expenditure where it is difficult to apply any granularity of judgement. In the case of EAGF, the necessarily subjective nature of the allocation of the markers has a significant impact on reported climate expenditure. A determinedly conservative approach risks making the target much more difficult to achieve; a less conservative approach risks the criticisms levelled at it by the ECA and by our assessment above. One option to consider would be to take a conditional approach to the allocation of climate markers, based on (i) a clear, quantified, statement of the expected climate impact and (ii) delivery in practice of those impacts.

4.2.3 Application of climate markers to measures permitted under shared management programmes

For those ESIF programmes where expenditure is based on programme authorities choosing from a list of expenditure options laid out in the programme legislation – notably EAFRD and EMFF – the approach adopted has been to apply the climate markers at the level of those measures. This seems an appropriate simplification – while in practice there may be differences in the way in which programming authorities implement the measures, and the purposes for which they use them, a project-by-project based assessment has both greater risks of inaccuracy, and a greater administrative burden. However, the approach adopted to the allocation of climate markers to those investments should be demonstrably conservative – this has not been the case.

4.2.4 Application of climate markers to types of investment under shared management programmes

Finally, the approach adopted by ERDF and CF expenditure relies on a highly developed list of 123 intervention codes, providing a highly granular mechanism for assessing climate contributions, without relying on a detailed project-by-project analysis by managing authorities (which would pose significant challenges in terms of consistency). There are clearly many advantages to this approach, particularly in terms of administrative simplicity, and fine-grained detail of reporting; although (as with all areas of climate marker application) it is highly dependent on the robustness and conservatism of the application of the markers. It should be noted, however, that the system is largely reliant on a single

[215] ECA 2016

code being determined for each intervention, with risks that relatively high-scoring climate codes are chosen without a strong justification (and also risks that some climate-relevant action is missed). The possibility of overestimation has been partially addressed in the programming, when the Commission services were also checking the proposed categories of intervention, and (to the extent possible given the volume of information in programme documentation) advising where these appeared to have been misapplied. The Commission's ex post evaluation of ERDF and CF expenditure in the 2014-2020 period could usefully include an examination of (i) the consistency with which codes are applied to similar types of investment across different programmes and (ii) the extent to which the aggregate expenditure under climate marked intervention codes bears out expectations on its relevance to climate objectives. If a similar system is adopted in future programming periods, such an analysis could provide an evidence base for refining the intervention code system with the aim of making it more straightforward for managing authorities to apply it in a manner which consistently and accurately reflected climate impacts.

4.3 Behavioural impact of different approaches

There are a number of areas where the nature of the tracking methodology has the potential to affect the quality of the data. A more detailed assessment of expenditure would be necessary to determine whether these risks have indeed led to problems with the accuracy of the data reported against the 20 % target; but there may in any case be value in considering options for guarding against these risks in future programmes, and ensuring (as far as possible) that there are positive incentives both to allocation of funds to climate objectives, and to the accurate reporting of such expenditure.

4.3.1 The impact of expenditure targets

Targets for climate expenditure in programmes have been introduced in a number of programmes, both centrally managed (DCI) and under shared management (ERDF – where there is low-carbon earmarking and horizontal mainstreaming of climate obligation – and EAFRD). While there is a clear logic to such targets in helping to ensure a climate focus to programmes in practice, where the expenditure concerned is not ring-fenced (as in the case of LIFE Climate Action), there is a risk that the tracking data will be consciously or sub-consciously boosted to help meet the minimum spend target. Thus, for ERDF/CF expenditure, managing authorities may be more drawn to record an investment under TO4[216]. For expenditure under the EAFRD or EMFF, choices between measures may be affected by the need to meet the relevant target – and while this is precisely the intention of the target, and should in principle allow programme managers to identify the most effective way of contributing to the target, it places a high premium on accurate allocation of climate markers to the measures. While ring-fenced funds for climate objectives within programmes would to some extent run counter to the objective of mainstreaming climate objectives, the potential advantages of such an approach should also be analysed for future programming periods.

4.3.2 The impact of an ex ante approach to applying climate markers

As noted above, the Commission's approach relies heavily on ex ante application of climate markers, either at programme level, or on selection of projects. We note above the value of examining the extent to which expenditure on climate objectives happens in practice, and retains its climate focus. We do not have evidence of a consistently lower level of delivery of climate projects, or a pattern of projects losing the intensity of their climate focus. There are, however, some potential behavioural impacts which could create such effects. Project officers, or national and regional authorities for programmes under shared management, may be subject to innocent optimism bias, particularly when identifying projects as being of climate relevance helps in the delivery of the wider target. Introducing an element of ex post verification, on a sample basis if necessary, or a system of regular validation and consistency checking (such as that used for the DCI) could help to reduce the risk of optimism bias.

[216] However, it should also be noted that the earmarking requirement has been overachieved by about 50%, and that climate-related investments were also recorded under the other TOs.

4.4 Consistency of approaches

Where the nature of contributions to climate objectives are similar, in principle, similar approaches should be expected to the implementation of the EU climate markers. However, there appears to be inconsistency between the generally conservative approach adopted to investments under LIFE Environment, and the assessment of climate impacts from environmental and land management measures under the EAFRD; there is also potential for similar projects under, for example, CEF, ERDF/CF, and EU external action programmes, with climate markers applied according to different methodologies. While the project scope has not allowed for a systematic identification of all relevant areas where the current tracking system applies either different methodologies or different judgements to similar types of investment, we note that the Commission's Reflection Paper on the Future of EU Finances[217] suggests that "Coherence could also be improved via a single rule book for cohesion policy and other funding instruments with programmes or projects of the same type". If this recommendation is taken forward, it would provide a valuable opportunity for ensuring that climate tracking markers are applied in a consistent way.

Even in the absence of a single rulebook, however, greater methodological consistency could be achieved by providing greater clarity on the meaning of the words "significant" and "moderate" when applied to the contributions made by expenditure. While the EU approach has the advantage over the OECD approach of being more focused on results than on intentions, it is nevertheless significantly vaguer in terms of its definitions. The inclusion of expenditure such as the permanent cessation of fisheries measure in the EMFF, and the areas facing natural constraints measure in the EAFRD in the "significant contribution" category where climate impacts play little or no part in their intervention logic also weakens the sense in which the recorded expenditure can be regarded as spent "on" climate objectives.

Within programmes, we note risks of inconsistency in a number of programmes where the methodology involves assessment of individual projects or investments, (Horizon 2020, LIFE) and also in the ERDF and CF where climate impacts are recorded on the basis of the intervention codes allocated on a case-by-case basis to individual projects (notwithstanding the detail of the methodology applied). The approach taken to improving consistency in the DCI seems to be a best practice, which we recommend for wider consideration in centrally managed funds, subject to analysis of the potential administrative cost. Options for improving consistency in funds under shared management are included in section 3 above.

4.5 Differentiation between mitigation and adaptation

The 20 % target does not distinguish between climate mitigation and adaptation, and it is therefore unsurprising that Commission methodologies for its implementation do not do so either. However, the two policy objectives are very different in nature, and it is therefore valuable for policymakers to have a good understanding of the specific contributions made to each in practice, in order to be able to assess whether a programme or fund is making the expected level of contribution to the relevant objective. Our assessment of expenditure suggests that there are some areas where the existing methodology could achieve such an identification with relatively limited effort; and other areas where the data provided by the tracking exercise currently does not allow for such differentiation. For example, where markers are applied on the basis of a set list of factors for specific measures or types of investment, such as in the case of ERDF and other Structural and Investment Funds, it should be relatively straightforward for the relevant Commission services to set out the basis for that judgement, and the extent to which it is based on adaptation benefits, mitigation benefits, or a specified combination of the two. The same applies to ex ante application of the markers at programme or sub-programme level (EAGF, Copernicus). Project by project assessments, however, would require fresh data based on a detailed exercise examining the justification in each case.

For future programmes, however, it is clear that the enhanced link between climate objectives and climate expenditure that is implied by the Commission's aim of a "Budget focused on results", and which would help to ensure a greater focus on whether identified climate expenditure is in practice

[217] EC (2017) Reflection Paper on the Future of EU Finances, https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

delivering commensurate impact, can only be achieved by a consistent separate identification of the respective adaptation and mitigation benefits. Care will, however, need to be taken to manage the potential impact on overall reported climate relevant expenditure – for example, an overly simplistic approach could lead to a project or measure regarded as contributing significantly to mitigation (100 % marker) could also be considered as contributing "moderately" to adaptation (40 % marker), for a total of 140 % being used for overall climate expenditure. Assuming the Commission continues to want to cite an overall "climate" contribution, one approach would be to ensure that the total implied by the current climate markers is not exceeded, but that the identified climate expenditure is instead allocated identified between mitigation and adaptation targets. An alternative approach would be to ensure that all statements of climate expenditure separately detailed an overall climate contribution; followed by figures for mitigation and adaptation respectively which could sum to more than that total.

4.6 Over-optimism in reporting of climate contributions

We have identified a number of instances where the reporting of climate contributions appears to be, or risks being, over-generous in respect of the significance of the climate contribution delivered These are set out in detail in Table 3-1, and examples are listed briefly below.

EMFF

Treatment of the permanent cessation of fishing activities measures (100 %), and the port investment measures (40 %).

EAFRD

Treatment of the "areas facing natural constraints" measure (100 %)

EAGF

Expenditure to which the markers applying to greening are applied (including direct payments to greening-exempt farms, and the treatment of financial discipline); and the extent to which a 40 % contribution from cross-compliance (applied to 20 % of the non-greening budget) is justified by the climate contribution generated by the expenditure.

We also consider that there is a risk of systematic over-optimism in the ex ante assessment of projects across programmes. While the scope of study has not allowed for a detailed examination of ex ante assessments, wherever the potential climate impacts are likely to be a factor in project selection, there is a prima facie likelihood that project sponsors will present a positive picture of the potential benefits.

4.7 Under-emphasised climate contributions

EU climate markers, if properly implemented, should mean that some areas of expenditure with a relatively minor climate impact are not recorded. While not including such areas of expenditure within the data on delivery of the 20 % target seems consistent with the likely political understanding of the meaning of the target, and with the principle of conservatism, this nevertheless could represent an area where opportunities for improving the climate impact of expenditure are at risk of being foregone. Annex 2 identifies several areas of expenditure where the *potential* for a climate contribution appears to be under-exploited. In addition, we have identified in our review of the programmes listed in Table 3-1 some possible areas of under-recording. For example, under the ERDF, some directly climate-relevant expenditure (for example, energy efficiency research in large organisations) could be recorded under investment codes which do not attract a climate marker. Also, we note that ERDF support for research and innovation is based on a bottom-up approach ("smart specialisation"). As many of the smart specialisation strategies were not ready at the OP adoption it was not possible to indicate whether the allocations were likely to be used for climate related R&I investments. Energy and climate are one of the top priorities identified in these strategies[218] with the potential for significant funds to be allocated to them. Under the EAGF, while we share the ECA's doubts over the level at which the 40 % marker is applied to cross compliance, we note that there is an argument that the

[218] A database of the chosen priorites is available at: http://s3platform.jrc.ec.europa.eu/eye-ris3

marker chosen should be applied not only to the 70 % non-greening element of direct payments, but also to the third of the greening payment represented by the crop diversification requirement, since it is also subject to cross compliance and currently attracts no climate marker.

5 Conclusions, and identification of options for improving the financial tracking of climate-relevant spending in the budget

The introduction of a climate tracking methodology in the 2014-2020 multiannual financial framework, in response to the political commitment by the EU institutions, was a major undertaking, requiring cooperation among Commission services, and decisions on a wide range of judgements. This is a relatively new area of administrative activity, with little previous experience to serve as a model (so far as we are aware, there are no other developed economies which have attempted a similar exercise across the whole of the expenditure of a federal level of administration). A high level of detail in methodologies and a reasonable level of consistency has nevertheless been achieved. While it is outside the scope of our report, we recommend that Member State governments in the EU consider undertaking a similar exercise in the implementation of national budgets, ideally using methodologies compatible with the EU-level ones, as they develop in preparation for the next MFF.

5.1 Identification of options

Drawing on the analysis from the previous sections, we have developed potential options for improving the EU approach to tracking of climate expenditure towards the 20 % target These are set out in Table 5-1 below, using a simplified structure which identifies, first, the nature of the problem; then the possible option identified; the intended impact of the option in terms of the effectiveness, efficiency and coherence of EU expenditure policy; and points for consideration in respect of the feasibility of the option, including any implementation risks that need to be addressed.

Table 5-1 Overview of problems identified and potential options

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
Fund-specific recommendations (section 3)			
ERDF/CF: potential for investment code approach to climate tracking to lead to over- or under-estimating of impacts of investments	Carry out a sample ex post assessment to identify potential scale of under/over-estimation.	A relatively **cost-effective** approach to validating the accuracy of the investment code approach, and identifying any inconsistencies in categorisation. Should also add to the **transparency** of the Commission's methodological approach to tracking.	If the ex post assessment identifies significant problems, options for responding to them may be limited. Increasingly detailed guidance for managing authorities on investment code identification risks adding to administrative burden, and itself being inconsistently followed. However, there may be scope for simply applying a correction factor to reporting of data on climate spending.
EMFF: risk of over-estimation in application of climate markers	Revisit the allocation of markers to measures, particularly permanent cessation of fishing activities, and port investment, on the basis of evidence on climate impacts and on the underlying rationale for the measures.	Improved **effectiveness** and **coherence** of the reporting of climate expenditure, based on a more consistent approach across programmes.	As far as the next MFF is concerned, limited additional administrative burden is involved, given the likely need for implementing legislation to again identify the climate markers to be applied. Care should be taken to ensure that a consideration of each measure is undertaken from first principles, rather than simply rolling forward the marker applied under the current MFF.
EAFRD: risk of over-estimation in application of climate markers	Revisit the allocation of markers to measures, e.g. support in areas facing natural constraints, on the basis of evidence on climate impacts and on the underlying rationale for the measures. We recommend a detailed	Improved **effectiveness** and **coherence** of the reporting of climate expenditure, based on a more consistent approach across programmes.	As far as the next MFF is concerned, limited additional administrative burden is involved, given the likely need for implementing legislation to again identify the climate markers to be applied. Care should be taken to

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
	assessment of the climate results and relevance of measures in advance of future decisions on application of the climate markers.		ensure that a consideration of each measure is undertaken from first principles, rather than simply rolling forward the marker applied under the current MFF.
EAGF: risk of over-estimation of climate impact	Reconsider the application of climate markers, if not for the current MFF, then for the next, on the basis of a more conservative approach. In particular, address the issues of: (i) inclusion of greening expenditure for those farms which do not have to comply with the greening requirements and (ii) treatment of financial discipline. In addition, although the Commission's response to the ECA's 2016 report states that it considers its approach "sufficiently conservative", we think it is necessary to further address ECA concerns about the level at which the 40 % marker is applied to cross-compliance. For future MFF, consider applying a conditional approach to assessing "significance" of contribution, based on quantified mitigation and (if possible) adaptation impacts.	Improved **effectiveness** and **coherence** of the reporting of climate expenditure, based on a more consistent approach across programmes.	No feasibility issues identified; although could lead to a reduction in reported climate expenditure.
LIFE, Horizon 2020: risk of inconsistent application of climate markers	Measures to improve consistency should be considered, including (for LIFE) assessment of accuracy based on a random sample, and (for H2020) a proportionate ex post evaluation of climate impacts of projects; and	Minor increased **administrative cost**, but potential for validating and improving the reliability of the methodology.	No feasibility issues identified.

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
	improved sharing of experience and best practice among officials making judgements on climate relevance.		
Cross-cutting issues (section 4)			
Risk of imperfect stakeholder understanding of what the 20 % target means	We recommend that the largely symbolic nature of the expenditure target is made clearer, for example by expressing it as a commitment that "20 % of the EU budget will contribute towards climate objectives"; and that future financial frameworks aim to identify not just the climate contribution to climate objectives, but the (ideally quantifiable) impact expected from that contribution.	No administrative cost; improved **transparency**, and better **effectiveness** of expenditure as a result of a clear link between spending and results (in line with the "Budget focused on results" initiative).	Implementation challenges of an improved link between expenditure and expected results are addressed in Annex 5.
Risk that tracking against the 20 % target, or its successor, creates biases towards over-estimation.	To some extent, this risk can be tackled by a more rigorous and consistent approach to application of the markers, as suggested in our recommendations under section 3. In addition, wider application of ring-fenced budgets for climate action within programmes could be considered.	Improved **effectiveness** of expenditure in tackling climate objectives; but with some risk of reduced effectiveness in delivering funds' primary objectives, and reduced **efficiency** of expenditure.	Clearly requires a fund-specific approach in each case, based on the nature of the expenditure, the synergies with wider fund objectives, and potential for identifying specific climate objectives and structuring a sub-programme around them.
Tracking focuses on ex-ante commitments, not on expenditure in practice, leading to a risk of a divergence between the reported	An ex post assessment of expenditure should be developed, based where necessary on a random sample of investments and projects This could	Potentially significant **cost**, which could be mitigated by taking a random sample approach; but potentially increased **effectiveness** of future	Any problems emerging from an ex post approach to climate tracking would be likely to be too late to allow for correction of the approach in the

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
tracking results and real spending.	identify any systematic differences between commitments to climate expenditure and the real nature of the projects as finally delivered, and enable the Commission to report against the political commitment underpinning the 20 % target, which focuses on "EU spending", not commitments or planned expenditure.	expenditure, and increased **transparency** of reporting.	current MFF. Public presentation of the information, particularly if it identifies a discrepancy between projected and actual expenditure, should therefore focus on the need to improve climate delivery in future programming periods.
No differentiation between mitigation and adaptation expenditure in most programmes, and in aggregate reporting.	In association with a system based on a clearer link between budgetary allocations to climate objectives, and the delivery of measurable climate outcomes, it is important to develop a tracking system based on separate identification of mitigation and adaptation impacts.	Increased administrative **cost**, but significantly enhanced **effectiveness**, **coherence**, and transparency.	Given the different nature of mitigation and adaptation impacts, whenever the Commission identifies climate relevant expenditure, it must by definition identify adaptation and mitigation impacts separately. A process which records that separate identification is therefore in principle possible. However, care is needed to manage the impact on overall reported climate relevant expenditure, and ensure that the change does not lead to an artificial increase. We recommend either (i) not exceeding the current climate markers (as corrected for any under-or over-estimation), but allocating climate expenditure between mitigation and adaptation targets proportionally to the evidence on impacts; or (ii) separate reporting of the overall climate contribution, flanked by data for adaptation and mitigation respectively which may sum to a higher number.

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
The climate markers system is less suited to areas of expenditure where it is difficult to apply granularity of judgement. The subjective nature of the judgement on allocation of markers (e.g. EAGF) has a significant impact on reported climate expenditure	In areas of the budget where judgements need to be made ex ante affecting significant amounts of expenditure, a conditional approach to the allocation of climate markers, based on (i) a clear, quantified, statement of the expected climate impact and (ii) delivery in practice of those impacts. This is linked to the broader issue of an enhanced link between expenditure and delivery of outcomes.	Increased **transparency**, and potentially an enhanced level of trust in the accuracy of reporting against climate expenditure targets. In line with the "Budget focused on results" initiative.	Faces the potential challenge that co-decision on relevant programmes may reduce their effectiveness in delivering climate outcomes, compared to Commission proposals. Could potentially be addressed by asking independent bodies, such as the EEA, to assess climate impact of Commission proposals, and of drafts emerging from co-decision, on the model of the Congressional Budget Office in the US.
Different programmes apply different climate markers to similar types of expenditure, or use different methodologies for similar activities	Attempting to homogenise the application of markers across the EU budget would be a complex undertaking. However, if the proposal in the Commission's reflection paper on the future of the EU's finances to introduce a single rule book for cohesion policy and programmes which finance similar types of investment is taken forward, the additional administrative burden would be reduced, and the opportunity should be seized to ensure a consistent approach to the application of climate markers.	Increased simplicity and clarity for fund administrators; and increased credibility for the results of climate tracking.	A potentially significant investment of effort in analysing and categorising expenditure across programmes; although using the cohesion policy investment codes as the starting point would mitigate this problem; and, if a similar analysis is in any case being carried out to ensure a homogenised set of rules, the additional administrative burden would be negligible.
Lack of clarity on the meaning of "significant" and "moderate" contributions to climate objectives	We recommend developing a more rigorous approach to applying the 100% and 40% markers, based on more objectively measurable criteria, potentially incorporating some elements of the OECD approach.	Increased simplicity and clarity for fund administrators, and a clearer link between climate inputs and expected outcomes. Greater reliability of the sums reported as "contributing towards climate objectives".	No major feasibility issues identified although will require further work to refine the new rules on "significance". Could help to simplify negotiations between services in the Commission on the application of the 100 % and

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
	Thus a "moderate" contribution could be applied only where the positive mitigation or adaptation impacts were sufficiently relevant to be identified in the impact assessment for the measure or project, and where the measure or project was identifiably designed in ways which aimed to optimise the climate policy impact. For "significant" (100% marker) mitigation impacts, we recommend an approach based on the cost-effectiveness of the climate benefit, to ensure that the benefit delivered is significant commensurate to the size of the EU budgetary contribution, by reference to a carbon price yardstick. One possible choice would be the €35 per tonne carbon price projected for the EU ETS in the impact assessment accompanying the Commission's legislative proposals for the 2030 climate package[219]. Mitigation achieved at a higher cost to the EU budget per tonne would clearly not be cost-effective, and should therefore not be regarded as "significant" in comparison to the scale of the investment. For "significant" (100% marker) adaptation impacts, quantifiable		40 % climate markers. Further refinement to this approach could include: - Scope for "significant" contributions to be recorded at higher mitigation costs per tonne in cases where the investment is justified on the grounds of an EU added value in early deployment of new technologies or techniques, with a view to securing earlier cost reductions in sectors where emissions reductions in the medium term are identified as necessary to deliver the EU's long-term emissions reduction trajectory. A clear link to the EU's updated 2050 low-carbon economy roadmap. - Guidelines on identifying the mitigation benefit attributable to the EU budget contribution, in shared management programmes (ESIF operational programmes and rural development programmes) where the EU contribution is only part of the overall public sector investment. It would be appropriate in these cases to apply the cost per tonne criterion only to the EU budget's proportionate share of the resulting mitigation.

[219] SWD (2014) 15 final

Problem	Option for change	Expected impact	Feasibility, implementation, and risks
	criteria are more challenging to develop. One option for a more objective, but qualitative, approach would be to apply the 100% marker only to those measures or projects with a measurable positive impact on climate vulnerabilities identified in a national adaptation strategy or in the EU adaptation strategy.		

5.2 Recommended Package of options

All of the options identified in Table 5.1 above should be considered by the Commission; however, as the comments in the "Feasibility" column show, they require differing levels of effort; and some require a judgement from the Commission as to whether to emphasise the certainty of delivery of climate outputs, or administrative simplicity. Following our own review of the individual options, the following package represents one possible attempt to combine increased impact with a proportionate approach to the administrative burden. It is grouped into two categories of recommendation; the first are those which could (if the Commission chooses) already be implemented with respect to the current Multi-Annual Financial Framework, but which are also relevant to the next MFF; and the second are those which would require action in the preparation and implementation of the next MFF.

Changes that the Commission could adopt already in the current MFF include

> Revisit the allocation of markers to measures in the EMFF, particularly permanent cessation of fishing activities, and port investment, on the basis of evidence on climate impacts and on the underlying rationale for the measures.
>
> For EMFF and EAFRD, revisit the allocation of climate markers to measures, particularly the permanent cessation of fishing activities measure and the areas facing natural constraints measure, in order to identify whether their respective contributions can be regarded as "significant"; in the event of any revised assessment, consider amending the relevant implementing regulation, or (as a less disruptive step) reflecting the revised assessment in the reporting of climate tracking results.
>
> Ensure consistently accurate presentation of the 20 % objective (or the objective chosen for the next MFF), for example by referring to it as expenditure which "contributes towards climate objectives", and noting explicitly that the same expenditure may be tracked for more than one priority (egg biodiversity in addition to climate).

In the preparation and implementation of the next MFF, we suggest that the Commission adopts the following actions:

> For ERDF and CF, carry out a sample ex post assessment of the application of intervention codes in the 2014-2020 programmes to identify the potential scale of under/over-estimation of climate impacts, and the accuracy with which the codes are applied; and address any issues identified in the next MFF through either stricter rules on the application of intervention codes, or (see below) the use of a single methodology across EU programmes.
>
> For the EAGF, reconsider the application of climate markers on the basis of a more conservative approach (and reflecting the nature of the obligations applied post-2020 to EAGF beneficiaries), and in particular consider a conditional approach, assessing significance on the basis of an expected (and then delivered in practice) quantifiable contribution to mitigation and adaptation objectives, in line with the broader approach with regard to the "significant" and "moderate" markers suggested below.
>
> If the proposal in the Commission's reflection paper on the future of the EU's finances to introduce a single rule book for cohesion policy and programmes which finance similar types of investment is taken forward, take the opportunity to ensure a consistent approach to the application of climate markers for similar types of investment.
>
> We recommend developing a more rigorous approach to applying the 100% and 40% markers, based on more objectively measurable criteria, potentially incorporating some elements of the OECD approach:
>
> > Thus a "moderate" contribution could be applied only where the positive mitigation or adaptation impacts were sufficiently relevant to be identified in the impact assessment for the measure or project, and where the measure or project was identifiably designed in ways which aimed to optimise the climate policy impact.
> >
> > For "significant" (100% marker) mitigation impacts, we recommend an approach based on the cost-effectiveness of the climate benefit, to ensure that the benefit

delivered is significant commensurate to the size of the EU budgetary contribution, by reference to a carbon price yardstick. One possible choice would be the €35 per tonne carbon price projected for the EU ETS in the impact assessment[220] accompanying the Commission's legislative proposals for the 2030 climate package. Mitigation achieved at a higher cost to the EU budget per tonne would clearly not be cost-effective, and should therefore not be regarded as "significant" in comparison to the scale of the investment.

For "significant" (100% marker) adaptation impacts, quantifiable criteria are more challenging to develop. One option for a more objective, but qualitative, approach would be to apply the 100% marker only to those measures or projects with a measurable positive impact on climate vulnerabilities identified in a national adaptation strategy or in the EU adaptation strategy.

[220] European Commission SWD(2014) 15 Final. Impact assessment accompanying the document: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions
A policy framework for climate and energy in the period from 2020 up to 2030

Annex 4: Output/mobilised investment tracking

1 Introduction and objectives

1.1 Policy context

1.1.1 EU Energy and Climate commitments

The European Commission is looking at cost-efficient ways to make the European economy more climate-friendly and less energy consuming. Its low-carbon economy roadmap[221] suggests that by 2050, the EU should cut greenhouse gas emissions to 80 % below 1990 levels. Milestones to achieve this are 20 % emissions cuts by 2020[222], and 40 % by 2030[223]. Alongside these mitigation targets, the EU adaptation strategy helps to ensure that adaptation considerations are addressed in all relevant EU policies.

The delivery of the EU's climate objectives will require significant investment. At the time that the Europe 2020 Strategy was adopted, it was estimated that by 2020 public and private investment of ~€125 billion per annum would be needed to carry out climate mitigation actions across all sectors (including agriculture, buildings, energy, industry, transport, and waste). Further investment is also necessary for climate adaptation actions; and climate resilience needs to be built in to all long-term investments.

1.1.2 The Multiannual financial framework (MFF)

The multiannual financial framework (MFF) provides a framework for financial programming at the EU level. It lays down the maximum annual amounts ('ceilings') which the EU may spend in different political fields ('headings') over a period of at least 5 years. It also allows the EU to carry out common policies over a period that is long enough to make them effective. This long-term vision is important for potential beneficiaries of EU funds, co-financing authorities as well as national treasuries.

With a view to responding to the challenges and investment needs related to climate action, the European Commission is implementing a mainstreaming methodology during the current (2014-2020) MFF including by aiming to make at least 20 % of EU expenditure climate related.[224] The 'reflection paper on the future of EU finances'[225] published by the European Commission in late June 2017 further emphasises this aim to streamline and simplify the EU budget system in order to facilitate more efficient spending.

1.2 Objectives of the report

The objectives of this report are to provide a review of how the current (2014-2020) MFF arrangements for mainstreaming, and for tracking climate-related expenditure and its achievements, have operated in practice; and to make recommendations for potential options for improving the current approach and processes.

1.2.1 Scope of the current report

As part of the report a review has been performed of the different approaches that have been taken to mainstream climate change issues into EU budget programmes and financial instruments, as well as the approaches to track climate expenditure (inputs) through budget programmes, the leverage of investment from financial instruments (outputs) as well as the overall effects of these investments on greenhouse gas emissions and climate adaption actions (results).

Separate reports have been prepared for each of the different elements of the review (mainstreaming, inputs, outputs, results), along with a further report assessing the investment needs associated with

[221] COM(2011) 112, A roadmap for moving to a competitive low carbon economy by 2050. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0112
[222] COM (2010) 639, Energy 2020. A strategy for competitive, sustainable and secure energy. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1409650806265&uri=CELEX:52010DC0639
[223] COM(2014) 15, A policy framework for climate and energy in the period from 2020 to 2030. Available at: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52014DC0015
[224] COM(2011) 500, A budget for Europe 2020. Available at http://eur-lex.europa.eu/resource.html?uri=cellar:d0e5c248-4e35-450f-8e30-3472afbc7a7e.0011.02/DOC_4&format=PDF
[225] COM(2017) 358, Reflection paper on the future of EU finances. Available at: https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

the EU's climate targets. This current report presents the findings from a review of approaches to tracking climate related action in EU financial instruments as well as presenting options for improved consistency of this tracking.

In order to complete this task, we have taken the following steps:

- **Section 2 methodology**
- **Section 3 – Identifying and analysing the FIs**
  - Define what constitutes an FI.
  - Identify the financial instruments which have some EU budgetary input.
  - Refine the initial list of financial instruments to make our task manageable and focussed.
  - Collect and present information on the existing methodologies and guidance for reporting on the overall performance and climate relevance / impact of FIs.
- **Section 4 – Gaps, overlaps and discrepancies**
  - Present and discuss any gaps, overlaps and discrepancies in the current approaches.
- **Section 5 – Options and recommendations**
  - Options for addressing the gaps, overlaps and discrepancies

2 Methodology

The methodology that was followed in the implementation of the study is described below. A similar approach was followed for each of the different stages in climate tracking framework: inputs, outputs and results.

2.1 Selection of the budget programmes and financial instruments

An initial step in the analysis involved the selection of the specific budget programmes and financial instruments to be analysed in more detail.

While mainstreaming climate change considerations is important for all areas of the budget, in practice the potential for different areas of expenditure to deliver greenhouse gas (GHG) savings, or increase climate resilience, will vary considerably between the different budget programmes and financial instruments. It was therefore agreed that the review should focus on those areas of the budget that are expected to have the most significant climate-related impacts, since this is where the need for robust approaches to climate tracking are most important.

The budget programmes were selected on the basis of their relative contribution towards the total climate-related expenditure, as reported in the Staff Working Document accompanying the Mid-term Review of the MFF (SWD(2016)299)[226]. More specifically, all budget programmes with an expected climate-related expenditure of >1 000 million Euro, over the 2014-2020 programming period, were included in the in-depth analysis (see Annex 2). These cover 99.6 % of the total EU budget for 2014-2020.

The financial instruments (FIs) were also selected based on relative volume of funding, although this was based on total EU contribution to the FIs in question due to a lack of data on climate-relevant funding. The selection was then refined based on a qualitative assessment of the climate relevance of the FIs (e.g. if the instrument has an explicit objective to address climate change, and/or are targeted on a sector that is clearly climate relevant). As a final step, the selection was refined to ensure that it captured a representative sample of the different instrument types / designs that the EU budget supports, as well as to include selected instruments with strong climate relevance but which did not meet the investment volume threshold. The selected FIs were:

- Research and Innovation
  - Horizon 2020 Loans service
  - Innovfin SME guarantee
  - InnovFin SME venture capital
- Infrastructure, climate, environment and energy efficiency
  - Connecting Europe Facility (CEF) – Debt instrument
  - CEF – Equity instrument
  - Private Finance for Energy Efficiency Instruments (PF4EE)
  - Natural capital financing facility (NCFF)
  - Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) – The Loan Guarantee Facility (LGF)
  - Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) – The Equity Facility for Growth (EFG)
- Enlargement Countries
  - Guarantee facility – Western Balkans Enterprise Development and Innovation facility (EDIF GFI)
  - Guarantee facility II – Western Balkans Enterprise Development and Innovation facility (EDIF GFI II)
  - European Fund for Southeast Europe (EFSE)

[226] Commission Staff Working Document *Accompanying the document* Communication from the Commission to the European Parliament and the Council – Mid-term review/ revision of the multiannual financial framework 2014-2020. An EU budget focussed on results. SWD(2016)299. Brussels, 14.9.2016. http://ec.europa.eu/budget/mff/lib/COM-2016-603/SWD-2016-299_en.pdf

    - Green for Growth Fund (GGF)
    - Enterprise Expansion Fund (ENEF) (under EDIF)
    - Enterprise Innovation Fund (ENIF) under EDIF
    - Global Energy Efficiency and Renewable Energy Funds (GEEREF)
- Neighbourhood Countries
    - Facility for Euro Mediterranean Investment Partnership (FEMIP)
- Development Cooperation Instrument (DCI)
    - Investment Facility for Central Asia (IFCA) and Asian Investment Facility (AIF)
    - Latin American Investment Facility (LAIF) (2014-20)
- Financial Instruments under the European Structural and Investment Funds (ESIF) (2014- 20)
    - European Regional Development Fund (ERDF) and Cohesion fund (CF)
    - European Social Fund (ESF)
    - European Agricultural Fund for Rural Development (EAFRD)
    - European Maritime and Fisheries Fund (EMFF)
- Others (2014-20)
    - European Fund for Strategic Investment (EFSI)
    - European Development Fund (EDF) Blending Framework: Africa Investment Facility (AfIF); Caribbean Investment Facility (CIF); Investment Facility for the Pacific (IFP)

2.1.1 Data collection

The data collection process aimed to capture the following information:

- Specific monitoring and reporting requirements and procedures for climate-relevant elements of the EU budget
- Performance indicators and other metrics used in the monitoring and reporting of climate-relevant elements of the budget
- Methodological frameworks used in the assessment of performance of climate-relevant elements of the budget
- Guidance for the development and implementation of indicators and monitoring frameworks
- Results data on climate-relevant elements of the budget

2.1.2 Data analysis

The information gathered for each of the individual budget programmes and FIs was synthesised and further analysed in order to:

- Assess the relevance of the current indicators and approaches;
- Identify gaps, overlaps and discrepancies with the current approaches;
- Gather results data, and as far as possible quantify the GHG impacts of the current MFF.

The various indicators, methodological frameworks and guidance documents were mapped against each of the budget programmes and FIs, and then further compared with each other. This was used to identify potential gaps and inconsistency in the current approaches to tracking, but also particular strengths (e.g. best practice), and areas requiring further strengthening.

A broader review was also performed of selected methodologies, tools and guidance used outside the EU, in order to identify best practice from elsewhere which could be drawn upon by EU budget programmes.

2.1.3 Development of options for improvements

Drawing on the analysis of the tracking framework for the current MFF, and in particular the problem areas requiring strengthening, a series of options were then developed for strengthening the monitoring and reporting framework.

Options were identified for each of the problem areas identified in the earlier analysis. These considered both content issues for the monitoring and reporting (e.g. what needs to be reported) but also process issues (e.g. how to report the information).

The performance of each of the options was evaluated against a consistent set of criteria. These were:

- Effectiveness – in addressing the underlying problem areas

- Efficiency – including the cost/effort involved
- Feasibility – of implementation in practice (in terms of technical feasibility and political acceptance)
- Coherence – between the different elements of the budget

Following the evaluation of the individual sub-options, the most promising options were then grouped together into an overall package of recommended improvements.

This task is concerned with the existing methodologies and guidance for reporting on the overall performance of EU financial instruments (FIs), and in particular on the performance of those financial instruments of most relevance to climate.

The specific objectives of the task are:

- To analyse existing methodologies and guidance for reporting on overall climate performance of EU financial instruments.
- To identify gaps, overlaps and discrepancies in the current approaches.
- To propose options for improving consistency of climate tracking in EU financial instruments.

The ultimate aim of this task is to attempt to identify the overall EU budgetary input into FIs and how much of the finance provided by these FIs is climate relevant. With this knowledge, the aim is to suggest a method of reporting the EU supported climate relevant finance mobilised through FIs.

3 Defining and identifying EU supported financial instruments

3.1 What constitutes a financial instrument?

A first step in this analysis is to set out what we consider a financial instrument (FI) to be. This is important because it defines which EU instruments we should consider for our analysis.

Many types of FI can play a role in climate action finance, both via the EU budget and via national governments. They all serve different purposes depending on the type of project and the type of actor involved. The main purpose of some FIs is mitigating the financial risk of an investment (guarantees, insurance, credit lines, equity, subordinate loans), while for others their main purpose is to provide capital/ increase return on investment (debt, venture capital, grants).

Several challenges arise when trying to track the financial flows from these different instruments. An important challenge is that some instruments are not easily measured in monetary terms. A guarantee or insurance is only paid out if the investment defaults or has financial damage. Since some instruments are not easily measured in monetary terms, the value of instruments and investments towards climate-relevant spending is difficult to determine. This question plays a prominent role in the discussions around monitoring and tracking of international climate finance expenditures – for instance, discussions around valuing climate expenditures of specific instruments at face-value or grant-equivalent take place among main donors. This reporting challenge is also important in relation to projects implemented and deployed at the Member State level that receive co-finance from the EU budget. Another important challenge is that the effectiveness of the various instruments in delivering climate mitigation or adaptation is not captured in monetary terms: one euro spent through a guarantee may not mitigate the same amount of CO_2 emissions as one euro spent through equity, or debt.

Some of the most important types of FI for climate finance are described below:

- **Public-private partnerships (PPPs):** public finance can play an important role in leveraging to reach larger amount of private funding. This is usually done indirectly via subsidies and grants which are stepping stones for companies to reach more mature stages of developments where private funding is more readily available. However, public funding can also be more directly deployed to a public-private mixed financing approach. In the context of this project, public-private partnerships (PPPs) can therefore be defined as a financing instrument that combines investments from both public and private sources under a common umbrella that can then be accessed by various clean energy technologies depending on whether or not they fit that PPPs selection criteria. For example, a public-private partnership is employed within the European Fund for Strategic Investment (EFSI) launched in mid-2015. The analysis of FIs in this report discusses whether it makes use of Member State level funds as a match. All of the FIs in this report could be considered a form of PPP as they make use of public funds, i.e. there are no all private funds discussed.
- **Concessional debt** are loans with favourable conditions, e.g. below-market rate loan conditions. For a given level of borrowing, lowering interest rates reduces annual debt payments. An important criterion in determining how much a project can borrow is the percentage of a project's cash flows that are needed to service the debt. With lower interest costs, debt service costs fall, so more debt can be taken on without affecting the rating of the debt or raising its cost. The majority of renewable energy project costs occur at the beginning of the project with the initial capital investment – for example, the initial capital cost of wind, photovoltaic, and hydropower projects often comprise nearly 90 % of total project costs.[227]
- **Commercial market-rate debt** includes lending in the form of regular loans, non-recourse loans, more elaborate lending such as mezzanine, guaranteed loans & cash loans leasing and bonds. Most of the lending in Europe has been traditional lending by commercial banks, especially in the areas of wind and solar energies. Such loans can be to manufacturers as well as to specific project

[227] Nelson, David and Gireesh Shrimali (2014). Finance Mechanisms for Lowering the Cost of Renewable Energy in Rapidly Developing Countries. A CPI Series. Available at: https://climatepolicyinitiative.org/wp-content/uploads/2014/01/Finance-Mechanisms-for-Lowering-the-Cost-of-Clean-Energy-in-Rapidly-Developing-Countries.pdf

developers. As expected, national promotional banks and EU public finance are very active in debt finance, in particular when sectors ramp up or are more difficult to finance, such as energy efficiency projects.

- **Equity:** parallel to debt is over the counter (OTC) equity holding, often facilitated by banks and similar financial organisations. This plays an essential part in the development of clean energy technologies. A large range of organisations are able to provide opportunities for equity investments for the energy transition, this includes large utilities and energy plant developers. Via equity investments, investors from outside the energy sector, such as infrastructure funds, private equity funds, insurance companies and pension funds can take an interest in these new sectors.

An important issue in the monitoring of FIs is **leverage**. The EU financial regulations[228] state that Financial instruments 'shall aim at achieving a leverage effect of the European Union contribution by mobilising a global investment exceeding the size of the Union contribution. The leverage effect of Union funds shall be equal to the amount of finance to eligible final recipients divided by the amount of the European Union contribution'. The difference is made up of funds from other sources, ideally private funds. This is a key indicator in all EU supported FIs because the logic behind EU participation in this field is that borrowers of certain types (e.g. SMEs) and in certain sectors (e.g. R+D and energy efficiency projects) are not able to access finance as easily (if at all) as other borrowers. Two large questions concerning leverage of EU FIs are:

- **The nature / source of the non-EU funds**. If some of this other money is from another public source (e.g. MS funds) it could be argued that this is different to funds from fully private sources. This difference relates to the logic behind EU intervention being to attract private finance to certain lenders and project types.
- **The nature of the EU contribution**. As will be made clear in the rest of this section in some EU FIs, the EU contribution is of a different nature to the other contributions. In some cases, the EU contribution is effectively a grant (i.e. not repaid) and in some it used as pre-loan technical assistance (so related to making a project 'loan ready' and not repaid). There are good reasons related to the sectoral contexts of the FIs in question why this is the case. However, in accounting terms this causes difficulties in comparing (and summing up) the leverage between different FIs.

Expenditure which can be of relevance in assisting access to finance, but would not be considered a financial instrument by many, because the funds are not repaid, are:

- **Public direct investment** is balance-sheet finance from national governments or public (finance) agencies. Public agencies may decide to spend their own resources as direct investment in clean energy to either support a specific type of technology that may not be able to get financed via private financial instruments, or to leverage additional private investment. Public agencies might also use public direct investment for clean energy measures, such as rooftop-solar installations or energy efficiency measures that would reduce the climate impact of their own operations.
- **Policy-based incentives** include financial instruments such as subsidies, tax incentives and guarantees. Tax incentives are a very commonly used tool in government public finance, they can focus on downstream investment decisions for households and companies.
- **Grants:** most EU and national funding currently works by using grants, subsidising a particular project through the use of public money. Grants are a suitable tool for addressing specific market barriers (e.g. when projects are not financially viable under the current market conditions) or to support vulnerable consumers who do not have access to savings or debt products, or to provide technical assistance/capacity building for project development.

These allocation issues have been considered in the international climate finance debate already. The multilateral development banks (MDBs) have addressed this by proposing[229] to term grants and public-sector contributions as "climate co-finance". This definition excludes broader support packages that do not provide resources directly into the financing package for a given project / programme.

3.2 Identifying and refining the list of Financial Instruments

There is no official list that captures all the FIs that are linked to the EU budget. Centrally managed instruments are reported in the "140.8" EC report[230] and financial instruments under the European

[228] Article 140 of the Financial Regulations http://ec.europa.eu/budget/biblio/documents/regulations/regulations_en.cfm
[229] See details here: http://www.worldbank.org/en/topic/climatefinance/brief/tracking-climate-co-finance-approach-proposed-by-mdbs
[230] Prepared by DG ECFIN http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2016:675:FIN

Structural and Investment Funds (ESIF) are also reported annually[231]. The EU Financial Regulations contain definitions of what is meant by a Financial Instrument in EU terms. The definition of a financial instrument is described in Art. 139(2) and (3) and Art. 140(2) and (3) of the Financial Regulation and in more detail under Art. 2 of the Financial Regulation. These definitions lead to a number of instruments (which to the external observer appear to be EU FIs) being excluded from the FI reporting.

The financial instruments were initially selected on the general basis of:

- Having a contribution from the EU of €100m or over. In order to place some limit on the number of funds that need to be reviewed and to exclude the large number of relatively small MS level FIs (for example under the ERDF) that are very similar and are better considered as a group.
- Having some potential relevance to climate change. For example, FIs that have an explicit objective to address climate change, and/or are targeted on a sector that is clearly climate relevant (for example energy).
- Types of instrument: To try and ensure that we capture a representative sample of the instrument types / designs that the EU budget supports.

This initial screening excluded a number of FIs that may have significant relevance to climate change. These funds may also include some good practice on the mainstreaming and tracking of climate related expenditure, outputs and results that other FIs could learn from. For this reason, we have also included the LIFE Private Financing for Energy Efficiency (PF4EE) and Natural capital financing facility (NCFF) instruments in our review as these are energy / climate focussed funds which may provide some useful lessons for other funds. The screening and the adjustments has led to the following FIs being considered for analysis.

Table 3-1 Financial instruments considered for analysis

	Programme / Budget line	EU contrib
Research and Innovation		*m Euro*
Horizon 2020 Loans service	H2020	1 060
InnovFin SME guarantee	H2020	1 060
InnovFin SME venture capital	H2020	460
Infrastructure, SMEs, climate, environment and energy efficiency		
Connecting Europe Facility (CEF) – Debt instrument	CEF	2 400
CEF – Equity instrument	CEF	100
Private Finance for Energy Efficiency Instruments (PF4EE)	LIFE	80
Natural capital financing facility (NCFF)	LIFE	60
Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) – The Loan Guarantee Facility (LGF)	COSME	868
Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) – The Equity Facility for Growth (EFG)	COSME	432
Enlargement Countries		
Western Balkans Investment Framework (WBIF)	IPA II	
Guarantee facility – Western Balkans Enterprise Development and Innovation facility (EDIF GFI)	IPA II	22
Guarantee facility II – Western Balkans Enterprise Development and Innovation facility (EDIF GFI II)	IPA II	17.5
European Fund for Southeast Europe (EFSE)	IPA II	88
Green for Growth Fund (GGF)	IPA II	38.6

[231] Prepared by DG REGIO, with input from DG AGRI and MARE. Summaries of the data on the progress made in financing and implementing the financial instruments for the programming period 2014-2020 in accordance with Article 46 of Regulation (EU) No 1303/2013 of the European Parliament and of the Council Situation as at 31 December 2015 (Nov 2016)
http://ec.europa.eu/regional_policy/sources/thefunds/fin_inst/pdf/summary_data_fi_1420_2015.pdf

	Programme / Budget line	EU contrib
Enterprise Expansion Fund (ENEF) (under EDIF)	ENI	11
Enterprise Innovation Fund (ENIF) under EDIF	ENI	21.2
Global Energy Efficiency and Renewable Energy Funds (GEEREF)	ENI / EDF / DCI	81
Neighbourhood Countries		
Facility for Euro Mediterranean Investment Partnership (FEMIP)		224
Development Cooperation Instrument (DCI)		
Investment Facility for Central Asia (IFCA) and Asian Investment Facility (AIF)	DCI	287.6
Latin American Investment Facility (LAIF) (2014-20)	DCI	320
Financial Instruments under the European Structural and Investment Funds (ESIF) (2014- 20)		
European Regional Development Fund (ERDF) and Cohesion fund (CF)	ESIF	20 000
European Social Fund (ESF)	ESIF	949
European Agricultural Fund for Rural Development (EAFRD)	ESIF	455
European Maritime and Fisheries Fund (EMFF)	ESIF	80
Others (2014-20)		
European Fund for Strategic Investment (EFSI)	EU guarantee fund	16 000
European Development Fund (EDF) Blending Framework: Africa Investment Facility (AfIF); Caribbean Investment Facility (CIF); Investment Facility for the Pacific (IFP)	Separate to the MFF	total financial resources of the 11th EDF (2014-20) €30.5 billion

Table 3-2 Financial instruments not considered for analysis

Financial instrument	Reason for exclusion
Project Development Assistance (PDA)/ELENA	Grant not loan
Neighbourhood Investment Facility (NIF)	Previous MFF
The 2020 European Fund for Energy, climate change and infrastructure (Marguerite)	Previous MFF
Student loan guarantee facility	Not CC relevant
The Cultural and Creative Sectors Guarantee Facility	Not CC relevant
European Energy Efficiency Fund (EEEF) (co-financed by EEPR)	Previous MFF
Programme for employment and Social innovation (EASI)	Not CC relevant
Risk sharing instrument (RSI) and Risk sharing finance facility (RSFF)	Previous MFF
SME Recovery Support Loan for Turkey	Not CC relevant
NER 300 (Emissions trading system fund)	No direct contribution from EC funds
Guarantee fund for external actions - €1.19 bn Provide a “liquidity cushion” in order to avoid calling on the Community budget every time a default or late payment on a guaranteed loan arises’	Use is driven by demand (defaulting or late loans) – so hard to see how CC is relevant

3.2.1 Financial Instrument Data

Having identified the relevant EU financial instruments the next step has been to identify and gather information on the methodologies (including any guidance) that are used for reporting their outputs.

To ensure that the information that is gathered for each of the instruments is comparable, and to assist with the identification of gaps or inconsistencies, we used a standardised data capture template (fiche).

The following table summarises the key points on the financial instruments we have analysed. The points we have synthesised from the analysis are as follows:

- *Overall reporting and CC prioritisation* – This includes (where present / identified) information on the required reporting on 'overall performance' of the FIs. It also describes whether or not CC appears to be actively considered in the identification and selection of projects.
- *Budget allocation to CC* – Summarising whether the FI has done any ex-ante allocation of their fund to climate relevant issues, and if so how has this been done and does it appear appropriate.
- *Included in the 20 % CC target*? If the FI is currently included as a contribution to the target of achieving 20 % climate relevant EC budget expenditure.
- *CC reporting* – This column summarises the approach that the FI takes to collecting data and reporting on the actual climate relevant outputs, results and impacts (where this is due to occur and where such reporting is apparent) of the projects they provide finance to. We have not considered the quality of the procedures, for example their ability to capture the potential long-term impacts of lending designed to promote capacity building (which may have large long-term impacts).
- *Leverage* – This column summarises the approach the FIs report on the leverage they are intended to achieve and (where it is apparent) what they plan to report in terms of actual / final leverage. This is relevant to both overall and climate change performance. Includes consideration of whether or not the reporting on leverage appears in line with the current EC guidance.
- *Comment* – Other important points about the FI of relevance to our analysis.

Table 3-3 Methodologies and guidance for reporting on overall (CC) performance of EU financial instruments

Fund (and types of financial instruments)	Overall reporting and CC prioritisation	Budget allocation to CC	Included in 20 % CC target?	CC reporting	Leverage (in line with EC guidance?)	Comment
General Economic Development						
European Fund for Strategic investment (EFSI) **Debt and equity**	The Regulation sets out four Key Performance Indicators (KPI), which capture various dimensions of EFSI: the value added of operations, additionality; total investment; mobilisation of private finance. The EFSI Agreement sets out six Key Monitoring Indicators (KMI) The KPIs/KMIs are used for both ex-ante assessment and ex-post reporting of individual operations. Nothing CC specific. The proposal for an EFSI 2, appear to be addressing this, by adding an objective and proposing guidance – "The EIB shall target that at least 40 % of EFSI financing under the infrastructure and innovation window supports projects with components that contribute to climate action, in line with the COP21 commitments. The Steering Board shall provide detailed guidance to that end"	Nothing specific identified in current EFSI – though internal EIB procedures require consideration of climate issues. The scoreboard (for project selection) includes Sustainability and the project specific indicators could (potentially) include CC relevant factors. See previous column, indicating that for EFSI 2, a 40 % target (for the infrastructure and innovation window) should support projects with components that contribute to climate action. The detailed interpretation of this is still under discussion.	Not reported in the MFF mid-term evaluation climate mainstreaming table.	Current arrangements do not publicly report anything on CC impact of the fund as a whole or the individual investments. This data (ex-ante) appears to be collected by the EIB, but is not publicly reported. Some criticism in the past (e.g. by Bankwatch) of the high number and value of fossil fuel projects supported. The balance of energy projects is an area where the fund has (and is) responding (via adjustments in EFSI 2)	EFSI aims to use the EUR 21 bn provided by the EU and the EIB to mobilise EUR 315 bn of total investment in Europe. This implies a total multiplier of x15. While the actual multiplier can only be measured at portfolio-level and at the end of the investment period, the EIB Group is required to estimate total investment mobilised as a KPI to monitor progress toward achieving the EUR 315 bn target. Appears to be in line with EC guidance. There is no apparent match funding by other (MS) public funds.	High profile FI, but not included in the MFF mid-term evaluation. Proposal for EFSI2 is at the cutting edge (i.e. they are currently addressing the issues) in terms of CC targeting and mainstreaming.
InnovFin and Horizon 2020 loans service **(H2020)** **Loans and guarantees (and advisory services)**	The European Investment Bank (EIB), through the European Investment Fund (EIF), implements the financial instrument on behalf of the European Commission. As the WP is managed by EIB and EIF there are no standard proposal templates, proposal evaluation forms and therefore all possibilities for mainstreaming depend on EIB and EIF action, as	Under the current legal base for Horizon 2020, the possibilities for mainstreaming climate change through changes to the work programme are limited. The mechanism is a demand-driven approach, with no ear-marking for specific policy themes or actions	In 2015 (most recent year with data) – there was no contribution from the FIs. The literature indicates that this may change in the future based on an assessment of actual projects financed. It is not	The Commission could engage in a dialogue with EIB and EIF to adopt a common approach in strengthening climate in the Access to Risk Finance Work Programme. Tracking of climate action in this work programme is likely to be challenging, due to the need to work with intermediaries on reporting of climate action.	By 2020, InnovFin is expected to make over EUR 24bn of debt and equity financing available to innovative companies to support EUR 48bn of final R&I investments. Appears to be in line with EC guidance. There is no apparent match funding by other (MS)	Given that the demand-driven approach of the financial instrument is embedded in the legal base of the instrument, if the Commission wishes to develop a climate-specific finance instrument through InnovFin, it would

Fund (and types of financial instruments)	Overall reporting and CC prioritisation	Budget allocation to CC	Included in 20 % CC target?	CC reporting	Leverage (in line with EC guidance?)	Comment
	well as action among the intermediary banks participating in the programme.		clear how this will happen without Ex-post evaluation.		public funds.	need to seek to change the legal framework or to allocate funding from other parts of the MFF to create a climate-specific 'window' of funding.'
European Regional Development Fund (ERDF) (multiple types at MS level)	EC level guidance on FI design and procedures. For example, 'Ex-ante assessment methodology for financial instruments in the 2014-2020 programming period'	4 of the 11 thematic objectives are CC relevant. MSs required to allocate 20 % of ERDF funds to thematic objective 4 (low carbon) in more developed regions; at least 15 % in transition regions; and at least 12 % in less developed regions. Nothing apparent on FIs specifically.	The amount committed via FIs by Thematic objective and part of the ESIF (ERDF, CF, ESF, EAFRD and EMFF) is reported in the annual report[232]	MSs report OP (operational plan) expenditure to date via FIs under each thematic objective. Summing up the climate relevant thematic objectives FI spending mean this figure can be extracted. Detailed information, although not at the level of individual Member State FIs, is available in the Commission's 31/12/2015 situation report[232] " No (apparent) reporting on actual CC impact – the 'off the shelf' FIs have reporting requirements, which could include a Rio marker type assignment but not clear if this is the case.	In the previous financial period attracting enough private capital was a problem for some of the FIs in this programme. Complies with standard Commission procedures on leverage. Will include MS contributions in the leverage. There is a requirement to report leverage for all ESIF FIs.	Central guidance on eligibility and assessment.
European social Fund (ESF) (multiple types at MS level)	Detailed programme level reporting MS to Comm. FIs also reported. A handbook was produced by EIB under the FiCompass website on the use of financial instruments under ESF (FiCompass, 2016).	According to the ESF regulation ESF can contribute to thematic objective 4 via a 'secondary theme' (code 01) on "supporting the shift to a low-carbon, resource-efficient economy" through the improvement of education and training systems necessary for the adaptation of skills and qualifications, the up-skilling of the labour force, and the creation of new jobs in sectors related to the	See ERDF – nothing specific to CC apparent in the annual report – so no contribution yet	See EDRF – not possible to see if any ESF funding via FIs is CC relevant. All of the financial figures coming in under this secondary theme (code 01) will be included in the 2018 Programme Statement – this will presumably include FIs.	Complies with standard Commission procedures on leverage. Will include MS contributions in the leverage	

[232] Financial Instruments under the European Structural and Investment Funds http://ec.europa.eu/regional_policy/sources/thefunds/fin_inst/pdf/summary_data_fi_1420_2015.pdf

Fund (and types of financial instruments)	Overall reporting and CC prioritisation	Budget allocation to CC	Included in 20 % CC target?	CC reporting	Leverage (in line with EC guidance?)	Comment
		environment and energy.				
Cohesion Fund	Covered by the ESIF common provisions requirement (covers ERDF, ESF, EMFF, EAFRD). FIs reported alongside ERDF	See ERDF – but with a smaller scope	See ERDF. CF contribution included with ERDF in the annual report – so not possible to	As ERDF	Complies with standard Commission procedures on leverage, but will include MS contributions in the leverage	
COSME – Loan Guarantee Facility, Equity facility for Growth Guarantees and equity	Support of SMEs by improving their access to finance and help them with entering new markets is the key priority of the COSME instrument. Climate-relevance is not mentioned in the priorities of the COSME instrument. The predecessor equity FI was judged to allocate 16 % of its total to CC	There are no plans to reserve a specific share of the budget for climate relevant investments. This relates to the fact that the instrument uses a demand-driven funding model. Local intermediaries responsible for selection, with EIF guidance. The EIB reported that they do not request CC monitoring or data on intermediated loans.	In the MFF mid-term evaluation there is a predicted contribution from COSME towards climate spending (€163.2m). Not clear if this includes a contribution (of 16 % of the EU contribution) from the equity part (i.e. 16 % of (1/3 of €1,300m) = €69m).	Reports are available on the number and sector of loans, but nothing on their CC relevance. Requiring this extra data would be an additional admin burden for the EC (and the EIF and borrowers) – given the small size of the loans (average size of the COSME SME transactions is currently €33,000) this is a legitimate point.	It is assumed that the €1.3 bn available will leverage €25 bn of private capital[233]. There is no expectation/ requirement of MSs funds being used to 'match' the EU contribution (like they are in, for example, ERDF FIs) – though this may occur in some loans / guarantees.	The EIB are looking into the climate monitoring and data requirements on intermediated loans such as this, but the admin burden on small loans of doing this would be a major concern.
Connecting Europe Facility (CEF) – debt instrument, equity instrument	From a high-level perspective, climate change objectives and targets are effectively already mainstreamed into the CEF instrument. This does not, however, guarantee that the potential for the outputs of CEF to deliver climate change benefits will be maximised or even realised at all. Some concern that for energy distribution infrastructure resilience could be considered in more detail as could their energy efficiency.	According to the current ex-ante tracking methodology, it is estimated that 41.3 % of the planned budget for CEF-Transport and CEF-Energy will be climate-relevant (assumed to be true for the FIs – 4.75 % of total). However, at the implementation-level, climate objectives could be better integrated into working procedures and processes to ensure maximum uptake.	Yes – Energy 40 %, Telecoms 0 %, Transport varies – 0 % (road, noise, parking) to 100 % (innovative project), others 40 %	Nothing climate specific clearly requested, but it could be requested on a project specific basis. It is foreseen that a sampling of actual projects supported will take place at a later date to test the relevance of the overall marker applied to the transport mode – this may increase the 40 % share (the same is true for energy)	In line with guidance. The Debt Instrument is designed to cumulate investment by attracting additional financing of these projects by Member States and / or by the private sector – so the leverage may well include MS (public) funds.	

[233] COSME: the European Commission and the European Investment Fund sign agreement which will boost funding opportunities for SMEs http://europa.eu/rapid/press-release_IP-14-851_en.htm

Fund (and types of financial instruments)	Overall reporting and CC prioritisation	Budget allocation to CC	Included in 20 % CC target?	CC reporting	Leverage (in line with EC guidance?)	Comment
Energy / Environment / CC specific						
Natural Capital Financing Facility (NCFF) (part of LIFE)	General FI indicators: Outcomes, indicators and targets for the financial instrument will be agreed with the delivery entity. Specific indicators for NCFF; Financing made available by intermediate financial institutions under the financial instrument as a result of the funded projects (EUR m); Financing made available to Natura 2000 areas (EUR m); Impacts on climate resilience (exposure to climate change and sensitivity to its impacts) of regions and economic sectors Impacts on ecosystem condition; Employment creation (FTEs)	Only the EU contribution to financial instruments should be included in the tracking, the expected / achieved 'leverage effect' (mobilised additional public or private capital) should not be covered in the tracking exercise."	Yes	Tracking FIs should be at ex-post level only, owing to the demand driven nature of FIs under LIFE. In order to monitor the contribution of the NCFF to the LIFE objectives, the EIB reports on the relevant output and outcome indicators for each operation related to the targeted priority areas nature and biodiversity and climate change adaptation and related to the general objectives of the LIFE Regulation.	"During the initial pilot phase, the NCFF is expected to execute 9-12 operations (including indirect operations), or 3-4 operations per year. Individual investments would remain below EUR 10-15 million. The estimated leverage of the value of the facility to the LIFE provision is between 2.2 and 3.2-fold. Considering the possible contribution of final recipients to project costs in the order of 25 %, the leverage of total of investment to the LIFE provision could be between 2.8 and 4.2-fold. The total investment in natural capital management projects over the pilot phase could be up to EUR 420 million. The reporting requires information on leverage by source, so it should be possible to identify any public (MS) contributions.	General FI indicators include CC aspects. Relatively small scale in terms of no. investments. In practice, there has been very low uptake of funds and the approved projects do not target climate change objectives One of the very few instruments which is solely adaptation focussed. Managed by the EIB

Fund (and types of financial instruments)	Overall reporting and CC prioritisation	Budget allocation to CC	Included in 20 % CC target?	CC reporting	Leverage (in line with EC guidance?)	Comment
Private finance for energy efficiency (PF4EE) (part of LIFE)	As NCFF (above): Managed by EIB	This is an energy focussed instrument so the criteria for selection of projects includes energy efficiency improvements.	Yes	EIB provides DG CLIMA with an annual operational report with information as at 31 December of the preceding year. Report includes: Information on loans plus distribution of investments per sector (e.g. building refurbishment, renewable heating and cooling, renewable electricity, cogeneration, lighting, district network optimisation, production process optimisation and other); Primary energy savings generated (GWh and percentage) as a result of the Energy Efficiency Loans; Reduction of $C0_2$ emissions (tons of $C0_2$) as a result of the Energy Efficiency Loans	The estimated leverage of the value of the loan portfolio to the LIFE provision is 6-fold. Taking into account the possible contribution of final recipients to project costs in the order of 25 %, the leverage of total investment to the LIFE provision could be up to 8-fold." Support may include technical assistance – so this is arguably enabling as opposed to leverage. Reporting includes Private financing leveraged (EUR m) as a result of the PF4EE loans – so it should be possible to extract any MS inputs (if they occur).	Programme level leverage estimates are possible, but the precise levels will vary by project.
European Maritime and Fisheries Fund (EMFF)	EU MSs have to report on the financial results of their EMFF-funded projects on an annual basis. In the first year of reporting, MSs have to indicate what percentage of EMFF funding goes to climate relevant projects. In later years, this percentage is used to automatically track climate relevant expenditures.	There are no fund specific requirements for CC budget allocation. However, the EMFF's thematic objectives (and Union Priorities) provide opportunities for climate action funding in UP1 '' promoting environmentally sustainable, resource efficient, innovative, competitive and knowledge-based fisheries' and UP2 'fostering environmentally sustainable, resource efficient, innovative, competitive and knowledge-based aquaculture'.	See ERDF – yes	MSs have reported their expenditures on EMFF projects in previous years in their annual reports. However, due to the slow implementation, it is hard to judge to what extent actual expenditures will match the planned investments.	Based on the MS fact sheets the EMFF contributes 72 % to the total funding of the projects (this is based on the 5.7bln EUR allocated to the MSs). The remaining 28 % of the funding comes from the national governments. If the administrative expenditures are also taken into account (total of 6.4 billion EUR), the EMFF contributes 74 % and MSs 26 %. MSs are supposed to report on (private sector) leverage in their annual implementation reports, following the Common Provisions Regulation EU No 1303/2013 reporting procedures for ESIF.	

Fund (and types of financial instruments)	Overall reporting and CC prioritisation	Budget allocation to CC	Included in 20 % CC target?	CC reporting	Leverage (in line with EC guidance?)	Comment
European Agricultural Fund for Rural Development (EAFRD)	Reporting requirements are established under Article 46 of the Common Provisions Framework (CPF). MSs are required to include information on the use of FIs under EAFRD in their annual reporting on implementation of Rural Development Programs (RDPs) to the Commission.	Total funds for 2014-2020: €100 billion (accounting for ~20 % of CAP funding). Around 57 % of the EAFRD funding at EU-28 level was programmed to contribute to climate actions (accounting for 57 % of EAFRD funding at EU28 level) €1.5 billion has been earmarked for operations aimed at GHG and ammonia emissions reductions over the complete programming period.	Yes. See previous column. It makes a very large contribution to the target.	See ERDF Allocations for climate focus areas have been made but no details concerning monitoring of performance was located – not least in relation to finance mobilized.	MSs are supposed to report on (private sector) leverage in their annual implementation reports, following the Common Provisions Regulation EU No 1303/2013 reporting procedures for ESIF. Co-financing rates are adopted for each priority and fund, and by region where relevant, as follows: ○ Less developed regions: 85 %. ○ Regions with a GDP below the 75 % EU average for 2007-13: 75 %. ○ Transition regions: 63 %. ○ All other regions: 53 %.	
Economic Development outside of the EU						
Global Energy Efficiency and Renewable Energy Fund (GEEREF)	EIB guidance sets out the climate related standards for project applications supported by EIB finance. This also includes guidance on how to screen for climate mitigation and adaptation actions. Additional guidance has been developed by the Commission services for determining climate impacts and for climate change mainstreaming for blending facilities.	No specific climate-related earmarking takes place at the level of the FI. This is determined at the funding programme level – the GEEREF Impact Methodology (in accordance with the EIB's Environmental and Social Practices Handbook) take Energy, Environment and Sustainable Development objectives into account as 'eligibility criteria' for GEEREF funding	GEEREF projects that receive funding from EDF/ENI/DCI do contribute to the 20 % climate action spending target.	Annual reporting of quantitative financial data and associated impacts under the GEEREF impact methodology. The GEEREF impact methodology sets out key impact metrics which have been categorised under: Energy; Environment; Sustainable development; and Financial leverage. The metrics consider actual results (ex-post) and anticipated results (ex-ante) for the project's lifetime.	Financial Leverage is one of the financial performance indicators in the GEEREF impact methodology and is part of GEEREF's policy objectives. Leverage is calculated via the GEEREF level multiplier: Private capital attracted by the initial public-sector investment into GEEREF. At fund level, this is calculated by splitting the total fund commitments by the amount committed to the fund by GEEREF. At project level, this is calculated by splitting the total amount of equity and debt commitments by the amount committed to the fund by GEEREF.	

Fund (and types of financial instruments)	Overall reporting and CC prioritisation	Budget allocation to CC	Included in 20 % CC target?	CC reporting	Leverage (in line with EC guidance?)	Comment
					For 2015, a GEEREF multiplier of 6.8x is reported.	
EU Neighbourhood countries (ENI) Facility for Euro-Mediterranean Investment Partnership (FEMIP)	The FEMIP Trust Fund (FTF) is managed by the EIB and therefore their standard reporting requirements and procedures are applied. No specific prioritisation for climate change has been identified, aside from the CAMENA climate action envelope.	Under the FEMIP Trust Fund (FTF) a dedicated funding envelope, CAMENA, has been opened to support climate action in the MENA region with an initial GBP 15 mln from the UK government for TA and capacity building.	No	No relevant CC reporting procedures nor guidelines under the FTF have been identified.	According to the Southern Neighbourhood and FEMIP Trust Fund Annual Report for 2015, the FTF received EUR 53.9 mln from donor countries until December 2015, and managed to attract EUR 16.4 mln of co-finance from third parties. No further information on leverage requirements has been found.	
Enlargement countries (IPA) Western Balkan Investment Framework (WBIF) Enterprise Development and Innovation Facility (EDIF I and II) Enterprise Innovation Fund (ENIF) Enterprise Expansion Fund (ENEF)	Guidelines have been developed for TA grants within the WBIF's Climate Change Window (CCW), which was introduced to the WBIF in June 2013. The CCW aims to (i) assist in identifying the contributions to climate finance (mitigation and adaptation) from each project and (ii) to encourage improved design of infrastructure projects so that investments are made more resilient to current and future climate risks. No directly relevant guidelines for EDIF I and II, ENIF and ENEF were identified.	According to the 2016 Annual Report of WBIF around EUR 5.6 bln out of EUR 15.3 bln estimated investments has been invested in the Energy (EUR 4.3 bln) and Environment (EUR 1.3 bln) sectors. No directly relevant CC budget allocation for EDIF I and II, ENIF and ENEF has been identified.	No	Performance for WBIF is measured in financial terms following the guidelines for TA grants under WBIF CCW and tracks climate relevant finance alongside the Rio Markers principles. No directly relevant CC reporting procedures nor guidelines for EDIF I and II, ENIF and ENEF were identified.	Although the WBIF is monitored via a dedicated monitoring system, including tracking of financial results, there are no specific requirements for leverage. According to the WBIF Annual Report 2016, WBIF has leveraged EUR 760 million of leveraged loans between 2007-2016.	
Enlargement countries (IPA) European Fund for Southeast Europe (EFSE)	A dedicated reporting and monitoring framework has been developed for EFSE, but no clear reporting obligations/requirements for climate action nor priorities on climate change have been identified.	Not specified, although the small (household) loans can (indirectly) contribute to climate actions.	No	No relevant CC reporting procedures nor guidelines for EFSE have been identified.	No relevant guidance or guidelines for leverage have been identified.	
Enlargement countries (IPA)	Loan applications must include assessments of environmental	Not specified, although the loans provided under the GGF should	No. Despite the relevance of GGF-	Performance is measured in financial terms and considering the	Although the GGF is monitored via a dedicated impact	

Fund (and types of financial instruments)	Overall reporting and CC prioritisation	Budget allocation to CC	Included in 20 % CC target?	CC reporting	Leverage (in line with EC guidance?)	Comment
Green for Growth Fund (GGF)	and social impacts which are then reviewed. This must consider GHG emissions and any climate change mitigation or adaptation issues.	contribute to improvements in energy efficiency and energy savings.	funded projects.	environmental impact.	monitoring system, including tracking of financial results, there is no direct steer on (private sector) leverage, aside from co-finance of other (development) finance institutions at a project-by-project level.	
Development and Cooperation Instrument (DCI) Investment Facility for Central Asia (IFCA) Asian Investment Facility (AIF) Latin-American Investment Facility (LAIF)	In line with the reporting requirements set out under Regulation 236/2014 (Article 14), the Commission is required to report annual estimates for climate action expenditure for the AIF, IFCA and LAIF, and hence are required to contribute to the objective of addressing at least 20 % of the Union budget to a low carbon and climate resilient society. Additional guidance has been developed by the Commission services for determining climate impacts and for climate change mainstreaming for blending facilities.	No directly relevant CC budget allocation for the blending facilities are specified, aside from the Climate Finance Initiative (100 % contribution to CC). The report "EU International Cooperation and Development First report on selected results, July 2013 – June 2014" (EU, 2016), states "The climate-relevant part of all EU budgetary commitments made in 2014 for actions funded in the context of international cooperation and development was estimated at around 11.4 %	Yes, although the commitments cannot be tracked in the CRIS database (yet).	The performance indicators specified under Article 140 (8) of Regulation 966/2012 are mainly financial but there are requirements to estimate the climate aspects (assumed to be expenditure not carbon savings). The evaluation instruments used by DEVCO (mid-term, final and ex-post evaluations and ROM) are requested to check for mainstreaming of cross-cutting issues, including climate change.	The leverage effect of IFCA grants was in the range of 1:7 for funding between 2010 and 2015. The leverage effect of AIF grants was in the range of 1:30 for funding provided between 2010 and 2015. The leverage effect of LAIF grants was in the range of 1:29 for funding provided between 2010 and 2015.	
European Development Fund (EDF) – Blending framework Africa Investment Facility (AfIF) Caribbean Investment Facility (CIF) Investment Facility for the Pacific (IFP)	In line with the reporting requirements set out under the Cotonou Agreement (2000), the Commission is required to report annual estimates for expenditures of the EDF instruments. Additional guidance has been developed by the Commission services for determining climate impacts and for climate change mainstreaming for blending facilities.	No directly relevant CC budget allocation for each of the FIs has been identified.	No, the EDF is outside of the EU Budget and the current MFF.	No relevant CC reporting procedures nor guidelines for the listed FIs have been identified.	No relevant guidance or guidelines for leverage have been identified.	

3.2.2 Additional literature review

In addition to the review of financial instruments, we have also reviewed the literature for relevant information and opinions, both on the use of financial instruments in general and on the use of specific financial instruments in Europe from a climate perspective.

Treatment of leverage – Recommendations of the European Court of Auditors on the calculation of leverage in EU financial instruments

In its report 'Implementing the EU budget through financial instruments – lessons to be learnt from the 2007-2013 programme period[234]' (2016), the European Court of Auditors (ECA) makes a number of observations on the assessment of leverage for EU financial instruments.

The ECA notes that the Commission's measure of leverage for shared management instruments – the amount of finance to eligible final recipients divided by the amount of the Union contribution – does not properly take into account the extent to which public financing mobilises additional funds.

Since the co-financing rates are already specified at the level of the OP's priority axis, and the national contribution to the financial instruments' endowments generally remains within these rates, the ECA considers it inappropriate to count all public national funding as leveraged amounts. According to the ECA, only additional national contributions (going above the OP rates) should be considered as having been attracted by the EU contribution. It notes that the Commission's practice of excluding national public funding through the Ops from the denominator leads to an artificial increase in the measured leverage rate.

For centrally managed financial instruments, the ECA analysis concludes that the Commission uses various ways to calculate the leverage effect for different instruments. As a result, the leverage ratios reported by the Commission for centrally managed instruments are not comparable between themselves, and also not comparable with those for shared management instruments.

Moreover, the Commission's calculation of the 'leverage ratio' does not account for the fact that not all sources of finances attracted by a project are the result of the EU and/or national contribution. In particular, the ECA deems it unrealistic to consider national co-financing as leveraged by the EU's funding of the OP. It recommends that the Commission reconsider its methods of calculating the leverage effect of EU and national public funding through financial instruments, taking into account the alternative methodology proposed by the OECD, with calculations depending on the type of instrument (loans, guarantees or equity).[235]

The Commission response to the ECA recommendations (which importantly refers to the previous MFF rather than the current (or future) MFF) was that it is not planning to make additional efforts to revise and harmonise the methodologies to calculate leverage ratios and improve the distinction between public and private co-finance. The Commission deems the draft guidance note on reporting for funds with shared management that was published by the ESIF DGs in April 2016 and the refined methodology for calculation of leverage ratios for centrally managed funds, developed in June 2015, sufficient to give an accurate representation of the amount of co-finance leveraged through EU financial instruments[236].

The Commission's current approach to reporting leverage is captured in the overall guidance on financial reporting. This approach is currently being reviewed.

Use of financial instruments in helping the EU budget meets its 20 % climate spending commitment

The ECA special report 31[237] on this issue– looks at the majority of the EU budget, including cohesion policy and the common agricultural policy, but it does not include a number of the FIs. However, it did make some specific references to FIs, as follows:

Para 37 – Because of the fact that EU contributions to FIs are leveraged by other sources 'Tracking progress towards the 20 % in the EU core budget does not reflect the full financial effects of EU spending on climate action'. *EC response – The Commission agrees with the importance of financial*

[234] ECA Report available at: http://www.eca.europa.eu/Lists/ECADocuments/SR16_19/SR_FIN_INSTRUMENTS_EN.pdf
[235] OECD (2015) 'Methodologies to measure amounts mobilised from the private sector by official development finance interventions', DCD/DAC/STAT(2015)8, 24 February 2015.

[236] ECA (2016) http://www.eca.europa.eu/Lists/ECADocuments/SR16_19/SR_FIN_INSTRUMENTS_EN.pdf
[237] European Court of Auditors, special report no. 31: Spending at least one euro in every five from the EU budget on climate action: ambitious work underway, but at serious risk of falling short http://www.eca.europa.eu/en/Pages/DocItem.aspx?did=39853

instruments and their contribution to EU climate action and has included the budget contribution to these in its tracking of climate spending.

Para 60 – H2020 contribution is below the target partly because "According to the Commission, data on climate-related expenditure does not yet considering that some of the financial instruments which are tracked at project level, i.e. in a bottom-up manner (InnovFin SMEG and InnovFin SME VC) due to the biennial nature of the European Investment Fund's reporting"

Recommendation 2a – "The Commission should report, annually, consolidated information on the progress towards the overall 20 % target in its annual management and performance report and also report, with comprehensive information thereon, in each relevant annual activity report. This should include reporting on progress on action plans where they exist. In addition, information on the climate contribution of financial instruments should be reported." *EC response – The Commission does not accept the recommendation to report on financial instruments in the context of tracking budgetary effort towards the 20 % target.*

Financial instruments in international climate spending

Virtually all of the issues that arise in the identification, allocation and attribution of climate relevant funds from EU financial instruments have also been the subject of debate in the international climate finance and climate-aid community. Although there are differences, as pointed out in the EC's response to the Court of Auditors report when it commented on this issue, there is value in briefly summarizing the key discussions and emerging solutions adopted. A key part of this value is that there will be inevitably be comparisons made between the approaches, and the figures that emerge. Annex 2 of this report discusses the various approaches adopted in tracking international climate finance in more detail. A key concept of relevance to Financial Instruments is the MDB-approach of 'climate co-finance' they first proposed at COP-21 in Paris. A World Bank summary of this approach[238] provides the following definitions of climate finance and climate co-finance.

Climate Finance is defined as the amount of financial resources that are contributed to climate change mitigation and/or adaptation activities, as defined by the Joint Reports on MDB's Climate Finance:

> *Includes those financial sources which are managed by the MDBs such as trust funds, international climate funds, etc.*

Climate Co-Finance (CCF) is defined as the amount of financial resources contributed by external entities alongside climate finance invested by MDBs:

- *encompasses financial resource providers that are government or government-affiliated, as well as those that are private;*
- *includes all forms of financial instruments, including grants, loans, equity, guarantees, etc.;*
- *broader support programs that do not provide resources directly into the financing package for a given project/program are not included;*
- *is quantifiable and traceable to investment documentation kept by the individual MDB.*

The key points here are that the climate co-finance figure includes public sector match, and grant contributions to loans, but does not include broader support programmes that do not directly provide resources.

Programme and FI specific evaluations

There have been a number of DG CLIMA and other reports that have considered the climate mainstreaming in specific programmes and FIs. These have been reviewed as part of reviews of the programmes/ FIs in question.

[238] Tracking Climate Co-Finance: Approach Proposed by MDBs. Briefing Document | 4 December 2015
http://pubdocs.worldbank.org/en/260421452810381181/Briefing-MDB-Co-financing-final-04122015.pdf

4 Gaps, overlaps and discrepancies in the current approaches

Our analysis of the FIs involves comparing the methodologies and approaches to reporting the performance of climate-relevant finance that are being used (or planned to be used) under the different financial instruments. We are seeking to identify:

- **Potential areas of inconsistency**. Including inconsistencies in relation to the climate related part of the assessment e.g. which investment types are marked as climate-relevant, but also inconsistencies in relation to how the potential performance metrics are determined e.g. calculation of private finance mobilised.
- **Gaps in coverage**. This will identify both where methodologies and/or guidance may be lacking for a certain instrument, but also aspects of the guidance where there are gaps. For example, the guidance may not be clear on which types of investments should be marked as climate-relevant.
- **Overlaps**. This will identify instances where there may be risks of double counting, for example where an instrument is claiming savings which may also be claimed by another instrument. This is particularly relevant for instruments that blended funding from other sources.

As part of the analysis we are also drawing on the findings from previous studies, which are referenced where this occurs, that have explored some of these issues.

4.1.1 Definitions

A significant amount of effort has been expended on identifying and refining the list of financial instruments. This has highlighted the fact that there does not appear to be an agreed definition or list of EU financial instruments. Two reports which collate information on large groupings of FIs are the annual '140.8' report[230] on centrally managed financial instruments and the annual report on financial instruments under the European Structural and Investment funds (ESIF)[232].

The most recent report on centrally managed instruments quotes a 2014-20 budget envelope for financial instruments of EUR 8.4 billion which is targeted to support the financing of EUR 87.8 billion, implying an average leverage of 10.5, and an investment amount of EUR 137.6 billion. This budget excludes appropriations for successor instruments to certain instruments established for Enlargement and Neighbourhood or Development Cooperation countries.

The most recent (November 2016) ESIF report covers the situation as 31 December 2015. Given the early stage of the MFF, relatively little of the planned FI allocation has yet been committed, but the allocations to FIs are clear: ERDF and CF EUR 20 billion, ESF EUR 949 million, EAFRD EUR 455 million and EMFF EUR 80 million.

Our work has revealed a number of FIs which are not included in either of these reports. These exclusions include the EFSI, the EDF and the Guarantee fund for External Actions. The Commission explanations for excluding these funds from the Art 140.8 report are as follows:

- EFSI was designed with its own reporting requirements as a stand-alone instrument and does not fall under the scope of Chapter VIII on financial instruments of the current Financial Regulation. As a result, EFSI may not need to fully comply with provisions on financial instruments under Art.139 and Art.140 which also include requirements for reporting, state aid or exclusion of contingent liabilities.
- The 'Guarantee fund for external actions' has a contingent liability implied and thus the instrument is not a financial instrument in the sense of the Financial Regulation. It also predates the Financial Regulation.
- The EDF is excluded because it is not part of the MFF.

Assigning a total budget and total EU contribution to these FIs is not straightforward for a number of reasons. These reasons include:

- *The lifespan of the FIs*: There are FIs still operational that were set up with EU contributions from the previous MFF and some of them have had extra EU contributions, so the figures we find on the original fund sizes are out of date. The Art 140.8 report includes the FIs from the previous MFF, with a distinction made on the date of the contribution;

- *The nature of the FI*: In some of the instruments (e.g. ELENA, the Neighbourhood Investment Facility (and its successors as such as IFCA and AIF), which are known as FIs, some or all of the EU contribution is actually used as a grant, not a loan. In these cases, the grant is being used to help gain access to private finance, hence its association with FIs.

The differences in the EU financial regulation definition of what is meant by an EU financial instrument and what external stakeholders may consider to be an EU financial instrument are an interesting and relevant finding.

There are a number of other variations regarding the nature and management of the FIs:

- Some of the instruments, e.g. the EFSI, are stand alone and are not covered by the FI requirements of the EU Financial Regulations. Some are wholly under the control of specific programmes and some are funded from more than one source (for example the COSME FI has been moved to EFSI). the programme.
- There are other climate relevant financial and funding mechanisms which the EC is involved in. A key example here is the EU Emissions Trading System (EU-ETS) and its associated NER 300 fund. NER 300 is so called because it is funded from the sale of 300 million emission allowances from the New Entrants' Reserve (NER) set up for the third phase of the EU emissions trading system (EU ETS). The funds from the sales are to be distributed to projects selected through two rounds of calls for proposals. Under the first and second calls the EU distributed €2.2 billion of funds to support 38 renewable energy projects, with this expenditure leverage additional private funding of over €2.8 billion[239]. The NER 300 has been excluded because it is funded by EU-ETS income (mainly from electricity generators, and ultimately their customers) and not by the EU budget.

4.1.2 Overall reporting and climate action prioritisation

- Putting a figure on the number of FIs which quantify the amount or percentage of climate relevant finance they plan to provide is not straight forward. Some FIs do this, but some do not (even if at face value they appear to be entirely (or to a large extent) climate relevant. There are also variations in what each FI defines as climate relevant). The Rio markers are the most commonly used approach, but their use is not universal.
- It is also not straight forward to identify if and where the EU contribution to the FIs is currently included as a contribution to the 20 % climate relevant target. Some programmes, e.g. LIFE, explicitly include the contribution to the FIs. However, for other programmes the contribution is estimated at the top level and it needs to be assumed that this percentage applies to all spending (including FI contributions) under the programme.
- A number of FIs appear to have been left out from the calculation for the purposes of EU budget contribution to the 20 % target. There are understandable reasons why some of these FIs are left out, for example the FIs which receive European Development Fund support are presumably excluded because this fund is not part of the MFF. However, there are other FIs where there is no obvious reason for exclusion, e.g. the EFSI.
- In most FIs there appears to be the ability to define project specific indicators relating to climate change (or anything else), but it is hard to find information on whether or not this is done and if so what these indicators are.
- Virtually all FIs concentrate on reporting the financial rather than CC indicators of the projects they are supporting. This is not surprising because they are financial instruments managed by financial institutions. However, if CC impact is to be assessed it needs to be addressed. This is likely to be seen as a burden by fund managers, especially where the fund is not clearly targeted on climate relevant issues. The desire to simplify and standardise the procedures for financial instruments is a clear conclusion from the Commission's recent Reflection paper on the Future of EU Finances[240] and in the more detailed recommendations on rules (e.g. standardise rules for EFSI and Cohesion funds) from the High Level Group on Simplification[241].

[239] NER 300 programme description https://ec.europa.eu/clima/policies/lowcarbon/ner300_en
[240] Reflection paper on the future of EU finances. First published on 28 June 2017 https://ec.europa.eu/commission/publications/reflection-paper-future-eu-finances_en
[241] The future of EU finances: High Level Group presents proposals to simplify access to EU funds. 11/07/2017 http://ec.europa.eu/regional_policy/en/newsroom/news/2017/07/07-11-2017-the-future-of-eu-finances-high-level-group-presents-proposals-to-simplify-access-to-eu-funds

- A number of the instruments appear to target similar projects – for example TEN-E projects are mentioned by more than one fund – this may not be a problem (the TEN-E finance requirement is very large, and there are some differences between the funds) but there is a risk of duplication (and the funds competing with each other).
- The current proposals for EFSI 2.0 appear to be doing a good job in considering how a large scale and relatively 'general purpose' FI should address CC, having learnt from the criticism of the current arrangements for EFSI. I.e. a larger CC relevant target, better tracking, making good use of the European Investment Advisory Hub (EIAH) in terms of CC mainstreaming. Although more information is needed before this can be fully judged.

4.1.3 Budget allocation to climate action

- The concept of CC specific 'windows' within funds, allows more attention to be paid to the eligibility of the projects/investments supported – but ideally this approach needs to be carried on to the recording of outputs and impacts.
- Even with apparently sound procedures for CC impact assessment in place there is no guarantee that funds will do 'well'. For example, in the past articles by BankWatch[242] raised concerns about EFSI-related investments in energy. Although energy efficiency projects and renewables were clearly encouraged in the EFSI portfolio, investments in fossil fuel projects were still supported. According to the authors, 'during its first year, the fund leveraged €1.5 billion for fossil fuel infrastructure, and 68 % of transport investment is destined for carbon-intensive projects'. They recommend that fossil fuel projects should be taken off the EFSI agenda altogether. The current EFSI update is looking at ways to address this issue.
- Many of the instruments include advisory services (who's services include climate mainstreaming, or at least signposting to advice on climate mainstreaming), the target audiences are different but it is not easy to find the most appropriate advice and fund, despite the efforts of sites and groups such as FI-Compass and the European Investment Advisory Hub (EIAH).
- For demand-driven FIs (e.g. InnovFin) the general targeting approach is usually embedded in the legal basis of the instrument. If the Commission wishes to develop a climate-specific 'window' in these FIs it would need to seek to change the legal framework or to allocate funding from other parts of the MFF.
- Funds that are managed by the EIB should all apply their general assessment criteria, which include estimating the GHG impacts of the projects and the use of shadow carbon prices. However, this information is not made public.

4.2 Carbon output and impact reporting

- Some of the funds, which are focused on energy / climate have clear systems for assessing and monitoring carbon impacts. E.g. EEEF: The fund website directs users to the following website (a tool from the investment managers to measure carbon impacts https://deutscheam.com/greenstem). The EIB managed funds use their general approach, which includes GHG estimates and shadow carbon pricing (though this information appears to not always be publicly reported).
- There is much less detail (often nothing) on the reporting of climate relevant outputs and impacts than there is on the climate relevance of spending allocation.
- Multilateral development banks (MDBs) track their climate-relevant funding based on a combination of activity and technology levels. This tracking methodology is quite 'clean' in the sense that only the really relevant parts of investments are tracked and labelled as climate finance. The DFIs (bilateral development banks) use a hybrid form of tracking which combines what MDBs are doing and the RIO marker system.

[242] The best laid plans - Why the Investment Plan for Europe, does not drive the sustainable energy transition. CEE Bankwatch Network/Friends of the Earth Europe, Oct 2016 http://bankwatch.org/sites/default/files/best-laid-plans.pdf

4.3 Leverage of private sector funding

- The EU financial regulations have a simple definition of leverage which includes all non-EU contributions as additional. They also require the target and achieved leverage to be reported. This approach is followed for the centrally managed FIs which are reported in the Art 140.8 report and the ESIF FIs in the ESIF situation report. It is not guaranteed that this approach is also followed by the FIs which are not covered by these reporting obligations (e.g. the EFSI uses a more nuanced (transaction level) approach, which is described in the text box below.

> While the actual multiplier can only be measured at portfolio-level and at the end of the investment period, the EIB Group is required to estimate total investment mobilised as a KPI to monitor progress toward achieving the EUR 315 bn target. As a result, multipliers must be calculated at the level of each transaction and on an ex-ante basis. Measuring progress towards the achievement of the investment target depends on the assumptions made regarding the multipliers. Therefore, the EIB Group has dedicated considerable resources to developing, together with the EC, a methodology to estimate the multipliers for different types of products. The multiplier methodology provides a framework for linking the underlying EFSI support available with (a) the amount of EIB/EIF financing (the so-called "internal multiplier" – IM) and (b) the amount of total investment that is expected to be generated by such financing (the so-called "external multiplier" – EM).

- Reporting the leverage and the leverage on the climate relevant part of the spending / lending is not straight forward – all FIs report overall leverage targets, but actual leverage (especially on the projects that are classified as climate relevant) can only be assessed on a deal by deal basis.
- In some instruments which are called FIs (e.g. NIF, ELENA,) the EC contribution is partly or wholly a grant (i.e. non-returnable) so the contribution is clearly different to situations where the EC contribution to FIs where the funds are expected to be paid back. The 'monetary value' of the EC contribution to the FIs is also not straightforward, in some FIs the EC contribution is a lower priority for repayment than other capital contributions and the value of the concessional loan rate is greater in some sectors and in some countries than it is in others. This has implications in terms of what should be accounted as leveraged climate finance. The MDBs have proposed addressing this issue via the use of 'climate co-finance' to differentiate other public contributions and 'grant' type contributions.
- The treatment of MS public funds is an area where the CoA felt the Commission should clarify its approach. In terms of additionality to EC funds the logic of including MS public funds is understandable. However, it does imply a risk of double counting (if a calculation is done on the basis of public plus private and the assumption is made that all the non-EC money mobilised by an FI is private). In international climate lending, there is an agreed method for assessing the value of 'soft' (or concessional) loans. Currently, concessional loans are valued against face value (for TOSSD and UNFCCC reporting) and grant equivalency (for ODA reporting under OECD DAC), depending on the reporting purpose.
- Leverage data is typically presented at two levels – the target for the fund as a whole and project / transaction specific. There is variation between FIs in terms of level and reporting. The ideal for assessing leverage on climate relevant investments would be for this leverage to be differentiated (i.e. the leverage rate on the climate relevant aspect). This would reflect the (typically) higher risk profile of the climate relevant aspects.

4.4 Uncertainties and caveats

The following points and issues should be borne in mind:

- There may be other FIs of relevance which we have not identified.
- There are too many FIs to analyse each one in exhaustive detail – so there may be guidance notes or procedures that we have not identified.
- We have not looked at the MS level in those programmes and FIs where there is MS level management – mainly applies to the European Structural and Investment Funds.
- The public realm data on FIs is relatively limited.

5 Options for improving consistency of climate tracking in EU financial instruments

Drawing upon the analysis from the previous sections, we have developed potential options for improving the consistency of climate tracking in EU financial instruments based on the problems identified.

We have taken a simplified approach of the steps set out in the European Commission Better Regulation Guideline to provide a framework for identifying and then appraising the options – as follows:

1. **Problem definition**: Further consideration of the problems identified in the results analysis to verify the problem, determine its impacts in terms of scope and scale, identify drivers of the problem and establish a no-change scenario.
2. **Identification of options**: In response to the problems defined, a range of options are identified for improving in the current approach. These range from major changes (e.g. changes to legislation) to more minor alterations (such as developing a platform for signposting to existing guidance documents). The development of the options has drawn upon the examples of good practice and lessons learned – as identified through the earlier results analysis. In some cases the options proposed are a variation of one of the examples of good practice.
3. **Assess the options proposed**: The purpose of this assessment is to identify the most viable policy option for improving the consistency of climate tracking in EU financial instruments. The criteria to assess the policy options considers effectiveness (in addressing the problem areas), efficiency, coherence and feasibility (legal, political and technical).
4. **Outline the most viable package**: This final step brings together the individual options into a package of revisions that most effectively and efficiently address the problem areas.

5.1 Objective and problem definition

5.1.1 Objectives

The *primary objective* of activity in this area is to track and measure the extent to which the EU is succeeding in helping to mobilise private finance to address the causes and impacts of climate change. The need to mobilise additional private sector finance is based on the assumption that the scale of action required is very large, and that there are some barriers to attracting private finance to activities in this area that the EU can help address. The tracking and measurement is needed to provide feedback on the success of EU activity, i.e. if it appears that the amount of finance being provided by EU facilitated activity is not large enough to have any impact then this would suggest the potential need for additional and/ or redesigned activity. For the tracking and measurement to be accurate, comprehensive and credible there are several *process related objectives* that are the focus of our analysis.

- To ensure that EU financial instruments use consistent approaches to track and report climate relevant investments
- To ensure that EU financial instruments use consistent approaches to quantify the climate-relevant finance mobilised/leveraged
- To ensure that climate relevant finance mobilised/leveraged is tracked and reported by all EU financial instruments
- To ensure that methodologies to quantify the climate-relevant finance mobilised account for double counting risks.

Although these process related objectives are important it is important to bear the primary objective in mind when considering the options. This is particularly important when considering the administrative burden of any options to improve the accuracy, completeness and consistency of the data. There is a

balance to be struck between better tracking and risking imposing administrative burdens that undermine the take up of the finance.

5.1.2 Problems

The previous section in this report discusses the problems that our analysis has revealed**.** These include inconsistencies in approaches and gaps in coverage, which means that the information that is available on the climate finance that is mobilised/leveraged by EU financial instrument is incomplete and inconsistent. There is also a risk of double counting with other public sources. These problems mean the Commission is unable to generate a single mobilised/leveraged finance figure for the EU financial instruments.

- *Lack of definition of what constitutes an EU FI* – no complete list of FIs and no agreed criteria to populate such a list.
- *Lack of consistency (or existence) of climate 'windows' in FIs* – no consistent way of defining how much (if any) of each FI should be directed towards climate relevant action. This issue is covered in more detail in Annex 3 as it crosses over both programmes and FIs
- *Lack of consistency (or existence) of procedures to report climate relevant outputs and impacts* – this is covered in much more detail in another Annex 5 as the issue crosses over both programmes and FIs
- *Lack of consistency on measurement and reporting of leverage* – to indicate the additional funds made available in addition to those supplied by the EU.

These specific problems are explained further in the table below

Table 5-1 Problem definition

Issue	Problem definition	Scope of the problem	Drivers	Relevant stakeholders	No-policy change
Lack of definition of what constitutes an EU FI	No complete list of FIs and no agreed criteria to populate such a list	If the desire is to get a figure of the total amount of finance provided and leveraged as a result of EU action, there is a need to know which FIs to include.	Some FIs (e.g. EFSI) are not within the EC financial regulations definition of an FI. There are a large number of FIs with lifespans that overlap MFF periods, with some funded from EU sources outside the MFF.	European Commission officials FI managers (public (e.g. EIB) and private banks)	Difficult to present a credible and comprehensive figure for EU climate finance via EU FIs.
Lack of consistency (or existence) of climate 'windows' in FIs	Not clear for some FIs whether or not they aim to finance any climate relevant investments	Not possible to get a set of consistently defined expenditures on climate relevant investments	Some of the FIs do not consider themselves to be targeting investments with any climate relevance. Sector specific FIs use their own definitions of	European Commission officials FI managers (public (e.g. EIB) and private banks)	Inability to arrive at a consistent, credible or complete figure for the amount of climate relevant finance

Issue	Problem definition	Scope of the problem	Drivers	Relevant stakeholders	No-policy change
			climate relevance		
Lack of consistency (or existence) of procedures to report climate relevant outputs and impacts	No consistent systems and procedures to confirm if the claimed climate benefits are real.	The climate impacts may be over (or under) estimated	The FIs are driven by financial reporting (e.g. the total amount of money they have loaned and the returns generated) so climate reporting is seen as an additional burden	European Commission officials FI managers (public (e.g. EIB) and private banks) Loan recipients	Lack of confidence in the claimed climate benefits of the finance
Lack of consistency (with MDB approach) on measurement and reporting of leverage (though EC financial regulations do define this)	Different to MDB procedures and definitions in how the non-EU contributions to an FI are accounted.	The total value of finance (and climate relevant finance) enabled via EU FIs needs to be calculated from the sum of all relevant FIs – ideally this needs to be done on a consistent basis with other FIs and the MDBs	The FIs exist across a wide variety of sectors and contexts – what is considered match funding (leverage) by other lenders varies across these – the EC (in response to the ECA report) say they should not be compared to MDBs	MS and European Commission officials FI managers (public (e.g. EIB) and private banks) Loan recipients	Lack of credibility in the total leverage and the climate relevant leverage figure

5.2 Identification of improvement options

For each of the individual problem areas, a number of potential improvement options have been identified. To ease comparison, the options are categorised as either major changes (where a significant change in the current tracking approach is required), minor (where a small change in the current tracking approach is required), and guidance (where the tracking approach itself may not need to change, but guidance could be used to improve the effectiveness of the current approach). The different options are summarised in the table below.

Table 5-2 Identification of improvement options

	Major	Minor	Guidance
	Guidance		
Lack of definition of what constitutes an EU FI	Prepare guidance which considers the following factors and questions relating to including or excluding EC contributions to financial instruments: • The timing of the EU contribution – should funds that are still active, but are using funds from the previous MFF be included? • The source of the EU contribution – Most funds are covered by the MFF, but some have separate arrangements (e.g. the European Development Fund) should these be included? • The directness of the EU contribution – Some funds (e.g. the NER 300) only exist because of EU policy and intervention, but are not actually EU funds. Should these be included? • The planned or the actual contribution – The nature (responding to demand) of EU programmes means that these will always be somewhat different, and the actual can only be known ex-post. • The nature of the EU contribution – to decide how grants that are designed to enable / assist access to finance, or that are used to supplement repayable loans, are treated. Responsibility for collating the list would need to be assigned to some part of the EC – e.g. DG ECFIN who currently have an overseeing role on FIs. The approach of simplifying the rules, procedures and definitions of EU FIs is in line with the Commission's recent Reflection paper on the Future of EU Finances and with the more detailed recommendations on rules (e.g. standardise rules for EFSI and Cohesion funds) from the High Level Group on Simplification.		
Lack of consistency (or existence) of climate 'windows' in FIs	All EU FIs (with any potential CC relevance) have a 'CC window. This may well require changes to the legal frameworks of the programmes and FIs.	Data (on the nature of the individual loans) often exists, that would enable accurate CC impacts to be estimated (and /or monitored). However, in some cases the data is either not collated, or not made public or both. The collation and publication of this information is possible but it implies extra administrative burden – need to question if its justified. If available why not made public? FI specific review of the burden of collecting and collating loan specific data (where missing).	Develop a document that describes what existing data should be made available. For limited CC relevance / micro loan FIs. Estimate CC impact based on a sample / desk top review

	Major	Minor	Guidance
Lack of consistency (or existence) of procedures to report climate relevant outputs and impacts	Mandatory approach for all EU FIs (Covered in Annex 5 in more detail)	Voluntary approach for all EU FIs (Covered in Annex 5 in more detail)	Guidance (Covered in Annex 5 in more detail)
Lack of consistency on measurement and reporting of leverage	Mandatory reporting requirements with a flexible / categorised definition of leverage (in line with the MDB approach – climate co-finance)	Voluntary reporting requirements with a flexible / categorised definition of leverage (in line with the MDB approach – climate co-finance)	Guidance on reporting requirements with a flexible / categorised definition of leverage (in line with the MDB approach – climate co-finance)

5.3 Analysis of Options

The following sections attempts to assess the sub options in each of the problem areas.

Lack of definition of what constitutes and EU FI

Table 5-3 Lack of definition of what constitutes an EU FI

Policy option	Score (1; low – 5; high)				Comment
	Effectiveness	Efficiency	Coherence	Feasibility	
No-policy change	2	1	1	5	Effectiveness: Not possible to prepare a comprehensive or consistent list. Efficiency: No additional effort required, but a low score if the overall objective is considered. Coherence: No coherence between FIs in terms of inclusion in the list. Feasibility: Maintaining status quo would involve least effort in the short term – likely to have acceptance. No legal implications
Guidance on what should be included in an FI list – with responsibility assigned to appropriate DGs (e.g. DG ECFIN have the current responsibility to oversee FIs)	4	4	5	4	Effectiveness: Would enable an agreed list to be prepared. Efficiency: Some effort would be required to prepare and agree the criteria, and then to populate it. Populating could be outsourced. Coherence: Would strengthen coherence between FIs. In line with the simplification suggestions in the Reflection paper of the Future of EU Finances Feasibility: Would have cost implications in preparing and populating a list. Would also need agreement to be reached between the DGs on the inclusion criteria.

Our suggested approach to the main questions we think would arise in terms of drafting the list are as follows:

- *The timing of the EU contribution* –We suggest having two totals – one based on contributions made during this MFF period only (including 'top ups' to pre-existing funds) and one showing contributions during the period of the previous MFF. This should show the increase in activity that has occurred over time (which is politically useful) and should also help avoid any double counting (of previous MFF period contributions). The ESIF funds situation report already makes some references to expenditure under the previous MFF.
- *The source of the EU contribution* – Our suggestions would be to include the EDF, as it appears to have parallel accounting procedures to the MFF. The EFSI should also be included (which is in line with the recent recommendations from the High Level Group on Simplification (i.e. standardise rules for EFSI and Cohesion funds). Care would need to be taken if the resultant total was quoted as a percentage of total EU expenditure, because the total would need to include the total EDF funds.
- *The directness of the EU contribution* – We would exclude funds (e.g. the NER 300) which only exist because of EU policy and intervention, because if they were included it would raise the problem of where it is accepted that interventions are only (or are largely only) occurring due to EU policy. For example, a case could be made that EU targets and policies are an important driver

behind MS level subsidies for renewable energy, which in turn leads to large expenditure of private finance. However, trying to assign the relative importance of these EU targets and policies is subjective and the figures produced should not be combined with objective data.

- *The planned or the actual contribution* – The nature (responding to demand) of EU programmes means that these will always be somewhat different, and the actual can only be known ex-post. We agree with the current approach (in the Art 140.8 and the ESIF situation report) which is to focus on the ex-ante expectation of EU contribution and to update this in line with what is achieved on an ongoing basis. This allows data to be produced in advance and takes account of the delay imposed by needing to wait for actual expenditure data.
- *The nature of the EU contribution* – to decide how grants that are designed to enable / assist access to finance, or that are used to supplement repayable loans, are treated. We suggest excluding grants that are used for 'technical assistance', from the total EU contribution to financial instruments (and also excluding any finance that is attracted (wholly or partly) as a result of this technical assistance. Although the contribution to technical assistance should be included in the programme (grant) contribution. The treatment of funds effectively used as grant as a first part of a payment which is otherwise a loan is difficult. The other option would be to treat this like a grant (so not including the extra leverage in these loans, as this is consistent with how other grant expenditure is accounted). However, this is arguably different, as the grant is arguably a vital enabler of the other private finance, so this is an issue where the case is very difficult to decide (this issue is discussed more under leverage). The MDBs include this as 'climate co-finance'

We have suggested assigning responsibility to DG ECFIN as they have the current responsibility to provide an overview of the FIs (they collate the Art 140,8 report for directly managed FIs). DG Regio collate the ESIF FI situation report. Other DGs (and external fund managers) would need to feed into the reporting related to the FIs under their control. DG CLIMA and DG BUDGET may also wish to be involved in order to help identify and classify FIs in all parts of the EU budget, and to assess their climate relevance.

Lack of consistency (or existence) of climate 'windows' in FIs

Table 5-4 Lack of consistency (or existence) of climate windows in FIs

Policy option	Score (1; low – 5; high)				Comment
	Effectiveness	Efficiency	Coherence	Feasibility	
No-policy change	2	2	2	5	Effectiveness: Lack of consistency and completeness in capturing the climate relevant FI expenditure Efficiency: No additional effort required, but does not achieve the objective so low efficiency. Coherence: Limited coherence between FIs – some have windows some do not. Feasibility: No additional efforts required, so no difficulties

Policy option	Score (1; low – 5; high) Effectiveness	Efficiency	Coherence	Feasibility	Comment
Mandatory CC windows in all EU FIs	5	1	5	0	Effectiveness: Maximum possible identification of all CC relevant FI expenditure. Efficiency: Would require extensive legal changes and extensive efforts by the EU and external managers to change procedures Coherence: Maximum coherence between FIs Feasibility: Major legal changes, major administrative efforts, not in line with the logic of certain FIs – likely to be impractical
Mandatory rules on the publication of existing information (on the CC relevance)	4	1	3	0	Effectiveness: Relatively high on the assumption that more data exists than is published. Limited by the lack of data for some FIs and probable confidentiality concerns. Efficiency: Not clear what process could be used to make this mandatory – may well need changes to the legal base of all the FIs Coherence: Good for those FIs that have the data, but not where the data doesn't exist. Feasibility: See efficiency – unlikely to be practical.
FI specific review of the burden of collecting and collating loan specific data (where missing).	3	3	4	3	Effectiveness: This would test the completeness of the data and quantify the efforts required to collect missing data. Efficiency: Would require some one of and on-going effort, but would not require legislative change Coherence: This would increase coherence by judging all FIs on the same basis Feasibility: Would incur costs but much of the effort could be outsourced.
Develop a document that describes what existing data should be made available, and what gaps exist.	3	4	4	4	Effectiveness: If done comprehensively it would extract and use available data and show gaps (which could be addressed in the future) Efficiency: Many of the FI managers would make this data available without the effort of mandating it (if the process was made simple enough) Coherence: This would increase coherence by judging all FIs on the same basis Feasibility: Would incur costs, but less difficulties as there is no obligation for the FIs to take part

Policy option	Score (1; low – 5; high) Effectiveness	Efficiency	Coherence	Feasibility	Comment
For limited CC relevance / micro loan FIs estimate CC impact based on a sample / desk top review	4	3	4	3	Effectiveness: This is a good solution for the FIs in question. Efficiency: Requires some effort from FIs that may well do nothing on this issue at the moment Coherence: Improves coherence by engaging with these FIs which are currently excluded Feasibility: Requires some additional effort from FIs that many currently do nothing on this – difficult to make them do this

Our recommended combination of actions in this area is as follows:

- *A mandatory CC windows should not be considered for existing FIs, but should for all new and revised FIs* – Requiring formal CC 'windows' appears to be too large of a requirement to implement retrospectively. However, this should be considered as part of the process for any new (or revised FIs). The current proposals for EFSI 2.0 appear to be doing a good job in considering how a large scale and relatively 'general purpose' FI should address CC, having learnt from the criticism of the current arrangements for EFSI, i.e. a larger CC relevant target, better tracking, making good use of the European Investment Advisory Hub (EIAH) in terms of CC mainstreaming (see box below for more details). Although, this process is still underway.

EFSI 2 – The successor builds on the results of an EC and EIB evaluation of the EFSI[243]. The Commission has proposed a number of new objectives for EFSI 2. Including one on sustainability: "(1) The EC underlines the importance of sustainability by, inter alia, linking EFSI to more cross-border and sustainable projects, such as the COP21 climate targets, to help the 'transition to a resource efficient, circular and zero-carbon economy'. Investment in motorways should be avoided for all but cohesion countries." 'The EIB shall target that at least 40 % of EFSI financing under the infrastructure and innovation window supports projects with components that contribute to climate action, in line with the COP21 commitments. The Steering Board shall provide detailed guidance to that end". The proposal contains no details on these guidelines. It is important to note that the 40 % target is for projects with components that support COP21 commitments, and there is no indication of how large of a 'component' of project this would need to be in order to qualify.

The proposals for EFSI[244] also include an enhanced role for the European Investment Advisory Hub – "More targeted technical assistance services for projects involving several Member States, for projects that contribute to reaching the objectives of COP21, for digital infrastructures and for the combination of other sources of Union funding with the EFSI. This support will focus on needs not covered adequately under current arrangements. In addition, the proposal foresees that the EIAH should actively contribute to the objective of sectorial and geographical diversification of the EFSI."

- *Mainstreaming opportunities for existing FIs* -There is crossover here with the advice on mainstreaming, in that there are opportunities to improve the advice and guidance to lenders (and

[243] See summary in the Europarl briefing http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/593531/EPRS_BRI(2016)593531_EN.pdf
[244] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulations (EU) No 1316/2013 and (EU) 2015/1017 as regards the extension of the duration of the European Fund for Strategic Investments as well as the introduction of technical enhancements for that Fund and the European Investment Advisory Hub. COM/2016/0597 final - 2016/0276 (COD) http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52016PC0597

ultimately borrowers) about maximising the CC benefits (and minimising the impacts) of their activities.

- *Utilise existing data (on the nature of the individual loans) often* exists, that would enable accurate CC impacts to be estimated (and /or monitored). However, in some cases the data is either not collated, or not made public or both. The collation and publication of this information is possible, but it implies extra administrative burden – there is a need to question if its justified. Our suggested approach here is as follows:
  - *Ensure that the CC impact information that is already collected is made full use of* – For example the EIB have information on the nature of the individual loans, from ex-ante due diligence by them (although they have much less information on the individual loans made via intermediated loans). We suggest that this information should be collated and made public (subject to any confidentiality issues).
  - *FI specific review of the burden of collecting and collating loan specific data* – For those programmes where the end loans are very small (e.g. less than €100k), it would be overly burdensome to collect and collate data on every individual loan.
  - *For limited CC relevance / micro loan FIs estimate CC impact based on a sample / desk top review* – For those FIs which make a large number of small loans or appear to have limited CC relevance, there is a reasonable case to be made for selecting a sample and using an assessment of these to produce an estimate of CC relevance – this would ensure that all contributions are captured, and that data is captured on FIs which could support some positive CC impact.

Lack of consistency on measurement and reporting of leverage

Table 5-5 Lack of consistency on measurement and reporting of leverage

Policy option	Score (1; low – 5; high)				Comment
	Effectiveness	Efficiency	Coherence	Feasibility	
No-policy change	2	2	2	5	Effectiveness: Our analysis suggests that all the EU FIs report on leverage in the way prescribed in the Financial regulations (although it is beyond our scope to fully check this for all FIs and some FIs (e.g. EFSI) are not classified as FIs by the EU financial regulations). There is information on this available, but it is not consistent with the approach used by other lenders (including MDBs) Efficiency: No additional efforts required, but the lack of effectiveness reduces the efficiency Coherence: There is already coherence EU FIs, but the problems of lack of coherence with others will remain. Feasibility: No additional efforts required, so no feasibility questions.
Mandatory reporting requirements with a flexible / categorised definition of leverage (in line with the	4.5	1	4	0	Effectiveness: This would produce a harmonised set of data – though not as simple as the previous / current option Efficiency: Likely to require changes to the legal basis of FIs and programmes – the benefits would not justify this Coherence: This would produce a harmonised set of

Policy option	Score (1; low – 5; high) Effectiveness	Efficiency	Coherence	Feasibility	Comment
MDB approach)					data (full harmonisation may be difficult) Feasibility: Very likely to be impractical
Voluntary reporting requirements with a flexible / categorised definition of leverage	3.5	3.5	3.5	4.5	Effectiveness: This would improve the harmonisation of the reporting of leverage, but would be unlikely to be fully taken up Efficiency: No mandatory requirement for additional effort, easy for virtually all. Coherence: Arguably improves coherence, virtually all FIs will be able to comply Feasibility: Relatively easy to put in place, should not face the resistance of one definition option.
Guidance on reporting requirements with a flexible / categorised definition of leverage (in line with MDB approach)	3	3	3	5	Effectiveness: This would improve the harmonisation of the reporting of leverage, but would be very unlikely to be fully taken up Efficiency: No mandatory requirement for additional effort, easy for virtually all. Coherence: Arguably improves coherence, virtually all FIs will be able to comply Feasibility: Easy to put in place.

With regard to what the FIs could be requested to report on leverage we offer the following observations and suggestions.

- Should the figures be planned or actual?
  - The ideal solution in terms of timeliness and accuracy would be to do both – which is effectively the approach used in the ESIF report and in the Art 140.8 report. This enables the contribution from the FI to be added to the total contribution in advance – by using the programme level expectation to arrive at an ex-ante estimate. In order to confirm that reality matches expectation the actual leverage should also be periodically assessed on an on-going basis. The fact that leverage is a key financial indicator suggests that doing both should be possible, and not an extra administrative burden, for the financial institutions managing the FIs. If the figures are to be added up across FIs (including those that are missing from the ESIF and Art. 140.8 report) care will need to be taken on the compatibility of timings and assumptions.
- Include public sector contributions?
  - In order to avoid the risk of double counting of public contributions to reducing the causes and effects of climate change the ideal situation would be to exclude MS level contributions from the leverage calculation in EU supported FIs. However, in certain programmes (especially the ESIF) this combination of EU and MS funds is central to the logic of the programme, so this recommendation will be problematic if applied to all FIs. The ideal situation would be to separately account public and private contributions in addition to the EU contribution (in the same way as MDB's propose with their climate co-finance approach). However, this could become an administrative burden as there would need to be clear definitions of what is a public

contribution and this can become complex, for example how are contributions from publicly owned banks dealt with?

- Include grants and 'enabling' programmes?
  - We would suggest that the finance enabled by enabling / technical assistance expenditure should not be included in the leverage calculations. Although this expenditure is clearly useful and plays an important (often crucial) role in enabling finance it is of a fundamentally different nature to direct contributions to an FI. In evaluation terms, it is an impact rather than an output. This approach would be consistent with the way in which grant expenditure is accounted (in terms of CC relevance) because it is just the programme (grant) expenditure that is assessed and not the impacts (including additional expenditure) that the grant induces. The grant portion of the loan could be included in the 'co-finance' definition.

5.4 Recommended Package of Options

The combination of actions which appears the most promising from our analysis to date is as follows:

Prepare guidance on what should be included in an FI list. This is the vital first step in arriving at a reliable figure on the total amount of finance mobilised by EU FIs, and the percentage of this figure which is climate relevant. The simplification of EU FI procedures and definitions as suggested in the recent Commission Reflection paper on the Future of EU Finances and in the more detailed recommendations on rules (e.g. standardise rules for EFSI and Cohesion funds) from the High Level Group on Simplification would make this process simpler.

A mandatory CC 'window' / allocation should not be considered for existing FIs, but should be considered for all new and revised FIs. The benefits are not justified by the technical, legal and administrative burdens of doing this for existing FIs, but this should be considered when FIs are being created or substantially revised. The current process for EFSI 2.0 appears to offer a good model. It is highly likely that for some FIs this will not be appropriate and mainstreaming alone will be required. The definition of a CC window would need to be discussed and agreed and should be consistent with that used for assessing the contribution from other EU spending programmes.

Efforts should be made to fully utilise existing data (on the nature of the individual loans) to enable accurate CC impacts to be estimated (and /or monitored). For example, the EIB have information on the CC relevance of some of the FIs that they operate for the EU (though typically not those via intermediaries). We suggest that this information should be collated and made public (subject to any confidentiality issues).

Carry out an FI specific review of the burden of collecting and collating loan specific data, where it is not currently available. This would enable the feasibility of achieving a comprehensive identification of climate relevant spending. This will not be justified in some cases – see next point.

For limited CC relevance / micro loan FIs estimate CC impact based on a sample / desk top review – For those programmes where the end loans are very small (e.g. less than €100k), or have limited CC relevance, it would be overly burdensome to collect and collate data on every individual loan. In these cases, it appears reasonable to select and asses a sample to produce an estimate of CC relevance – this would ensure that all contributions are captured, and that data is captured on FIs which could support some positive CC impact.

Prepare guidance, with a voluntary reporting requirement, with a flexible / categorised definition of leverage in line with the MDB approach – This approach would allow a full discussion of the available options on the treatment of leverage and would allow the flexibility that is likely to be required to reflect the varying policy and sectoral contexts that EU FIs operate in. In combination with the above recommendations it would enable the calculation of a total figure for the amount of finance enabled by EU FIs and the amount of this finance that is climate relevant.

Annex 4 Appendices

Annex 4 Appendix 1 – Overview of main climate change relevant EU financial instruments

Annex 4 Appendix 1 – Overview of main climate change relevant EU financial instruments

Table A1-1 Overview of main climate change relevant EU financial instruments

FIs included	Programme / Budget line	EU contribution	Total (target)	Type
Research and Innovation		*m Euro*	*m Euro*	
Horizon 2020 Loans service	H2020	1 060	13 250	loans and hybrid or mezzanine finance to improve access to risk finance
InnovFin SME guarantee	H2020	1 060	9 500	
InnovFin SME venture capital	H2020	460	2 700	Early stage R+I driven SMEs and small midcap access to risk finance
Infrastructure, climate, environment and energy efficiency				
Connecting Europe Facility (CEF) – Debt instrument	CEF	2 400	18 000 to 45 000	Debt
CEF – Equity instrument	CEF	100		Equity
Private Finance for Energy Efficiency Instruments (PF4EE)	LIFE	80	540 to 1 000	Risk sharing plus technical assistance
Natural capital financing facility (NCFF)	LIFE	60	100 – 125	
Enlargement Countries				
Western Balkans Investment Framework (WBIF)	IPA II	Guarantee Fund €39.5m; Innovation Fund €32.3m	Guarantee Fund €212.5m; Innovation fund €160m	

FIs included	Programme / Budget line	EU contribution	Total (target)	Type
Guarantee facility – Western Balkans Enterprise Development and Innovation facility (EDIF GFI)	IPA II	22	118	
Guarantee facility II – Western Balkans Enterprise Development and Innovation facility (EDIF GFI II)	IPA II	17.5	94.5	
European Fund for Southeast Europe (EFSE)	IPA II	88	3 800	Public private partnership – for on lending
Green for Growth Fund (GGF)	IPA II	38.6	368	Energy efficiency and renewable energy projects
Enterprise Expansion Fund (ENEF) (under EDIF)	ENI	11	77	
Enterprise Innovation Fund (ENIF) under EDIF	ENI	21.2	50	
Global Energy Efficiency and Renewable Energy Funds (GEEREF)	ENI / EDF / DCI	81	892	Period is unclear
Neighbourhood Countries				
Facility for Euro Mediterranean Investment Partnership (FEMIP)		224	6 700	
Development Cooperation Instrument (DCI)				
Investment Facility for Central Asia (IFCA) and Asian Investment Facility (AIF)	DCI	287.6	2 720	total is to date
Latin American Investment Facility (LAIF) (2014-20)	DCI	320		
Guarantee Fund	General EU budget			The Fund is provisioned from the general EU budget and has to be maintained at a certain percentage of the outstanding amount of the loans and loan guarantees covered by the Fund. This percentage, known as the target rate, is currently 9 %
Financial Instruments under the European Structural and Investment Funds (ESIF) (2014- 2020)				
European Regional Development Fund (ERDF) and Cohesion fund (CF)	ESIF	20 000		'off the shelf' FIs available
European Social Fund (ESF)	ESIF	949		'off the shelf' FIs available
European Agricultural Fund for Rural Development (EAFRD)	ESIF	455		
European Maritime and Fisheries Fund (EMFF)	ESIF	80		

FIs included	Programme / Budget line	EU contribution	Total (target)	Type
Others (2014-20)				
European Fund for Strategic Investment (EFSI)	Own budget line	21 000	350 000	Loans, guarantees, equity
Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) – The Loan Guarantee Facility (LGF)	COSME	868	21 000	Guarantee
Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) – The Equity Facility for Growth (EFG)	COSME	432	4 000	Equity
European Development Fund (EDF) Blending Framework: Africa Investment Facility (AfIF); Caribbean Investment Facility (CIF); Investment Facility for the Pacific (IFP)	Separate to the MFF	Total financial resources of the 11th EDF amount to €30.5 billion		Separate to the MFF but still from MS contributions. Established in 2015 (AfIF) and 2012 (CIF, IFP). Transport, water, energy, agriculture, disaster prevention or mitigation, change adaptation, environmental protection

Excluded

Financial instrument	Reason for exclusion	Funding period	Progr / Budget line	Managed by	Available budget	Instrument type	Type of management	Eligible projects / Comment
Project Development Assistance (PDA)/ELENA	**Grant not loan**	Ongoing	H2020	EIB	EUR 80 million (2014-2017) [2] EUR 20 million (grants & TA)		Grants & technical assistance	TA for buildings, RES, CHP, urban transport, local energy infrastructure. Typically, EUR 6 – 50 million per project (EIB-ELENA also >50 million)
Neighbourhood Investment Facility (NIF)	**Previous MFF**	2008 2015	External blending facility	DG NEAR	€13.8bn. EU contribution €1,454m		Indirect	Energy, transport, climate change, infrastructure in neighbourhood countries
The 2020 European Fund for Energy, climate change and infrastructure (Marguerite)	**Previous MFF**				EU contribution €80m	Pan European equity fund		Supports infrastructure investments in

								transport (TEN-T), energy (TEN-E) and renewables
Student loan guarantee facility	**Not CC relevant**	2014-2020	Erasmus		Target Euro 3 000m EU contribution 517m	Guarantees – Erasmus+ Master loans		Loans for students to do masters courses in other countries
The Cultural and Creative Sectors Guarantee Facility	**Not CC relevant**	2016-	Creative Europe Programme		Target Euro 690m EU contribution 121m	Guarantees to banks		dealing with cultural and creative SMEs
European Energy Efficiency Fund (EEEF) (co-financed by EEPR)	**Previous MFF**	2011-ongoing	Not really under a programme – has its own budget line	DG ENER, managed by: Deutsche Bank	€265 million (€125 mln EU; €75 mln EIB; €60 mln CDP; €5 mln DB)	senior and junior loans, guarantees, or equity	Indirect	Energy efficiency, renewable energy and clean urban transport (for local or regional public authorities)
Programme for employment and Social innovation (EASI)	**Not CC relevant**	2014-20			€528 m total fund, €96m EU contribution	Micro finance and Social entrepreneurship		In the Art 140.8 report
Risk sharing instrument (RSI) and Risk sharing finance facility (RSFF)	**Previous MFF**							
SME Recovery Support Loan for Turkey	**Not CC relevant**	2014-20			€300m total fund, €30m EU contribution			In the Art 140.8 report
NER 300	**No direct EU funds contribution**							

Annex 5: Results tracking

1 Introduction

1.1 Policy context

1.1.1 EU Energy and Climate commitments

The European Commission is looking at cost-efficient ways to make the European economy more climate-friendly and less energy consuming. Its low-carbon economy roadmap[245] suggests that by 2050, the EU should cut greenhouse gas emissions to 80 % below 1990 levels. Milestones to achieve this are 20 % emissions cuts by 2020[246], and 40 % by 2030[247]. Alongside these mitigation targets, the EU adaptation strategy helps to ensure that adaptation considerations are addressed in all relevant EU policies.

The delivery of the EU's climate objectives will require significant investment. At the time that the Europe 2020 Strategy was adopted, it was estimated that by 2020 public and private investment of ~€125 billion per annum would be needed to carry out climate mitigation actions across all sectors (including agriculture, buildings, energy, industry, transport, and waste). Further investment is also necessary for climate adaptation actions; and climate resilience needs to be built in to all long-term investments.

1.1.2 The Multiannual financial framework (MFF)

The multiannual financial framework (MFF) provides a framework for financial programming at the EU level. It lays down the maximum annual amounts ('ceilings') which the EU may spend in different political fields ('headings') over a period of at least 5 years. It also allows the EU to carry out common policies over a period that is long enough to make them effective. This long term vision is important for potential beneficiaries of EU funds, co-financing authorities as well as national treasuries.

With a view to responding to the challenges and investment needs related to climate action, the European Commission is implementing a mainstreaming methodology during the current (2014-2020) MFF including by aiming to make at least 20 % of EU expenditure climate related.[248] The 'reflection paper on the future of EU finances'[249] published by the European Commission in late June 2017 further emphasises this aim to streamline and simplify the EU budget system in order to facilitate more efficient spending.

1.2 Objectives of the report

The objectives of this report are to provide a review of how the current (2014-2020) MFF arrangements for mainstreaming, and for tracking climate-related expenditure and its achievements, have operated in practice; and to make recommendations for potential options for improving the current approach and processes.

1.2.1 Scope of the current report

As part of the report a review has been performed of the different approaches that have been taken to mainstream climate change issues into EU budget programmes and financial instruments, as well as the approaches to track climate expenditure (inputs) through budget programmes, the leverage of investment from financial instruments (outputs) as well as the overall effects of these investments on greenhouse gas emissions and climate adaption actions (results).

[245] COM(2011) 112, A roadmap for moving to a competitive low carbon economy by 2050. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0112
[246] COM (2010) 639, Energy 2020. A strategy for competitive, sustainable and secure energy. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1409650806265&uri=CELEX:52010DC0639
[247] COM(2014) 15, A policy framework for climate and energy in the period from 2020 to 2030. Available at: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52014DC0015
[248] COM(2011) 500, A budget for Europe 2020. Available at http://eur-lex.europa.eu/resource.html?uri=cellar:d0e5c248-4e35-450f-8e30-3472afbc7a7e.0011.02/DOC_4&format=PDF
[249] COM(2017) 358, Reflection paper on the future of EU finances. Available at: https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

Separate reports have been prepared for each of the different elements of the review (mainstreaming, inputs, outputs, results), along with a further report assessing the investment needs associated with the EU's climate targets. This current report presents the findings from the review of approaches to track the "results" of climate related expenditure in the EU budget.

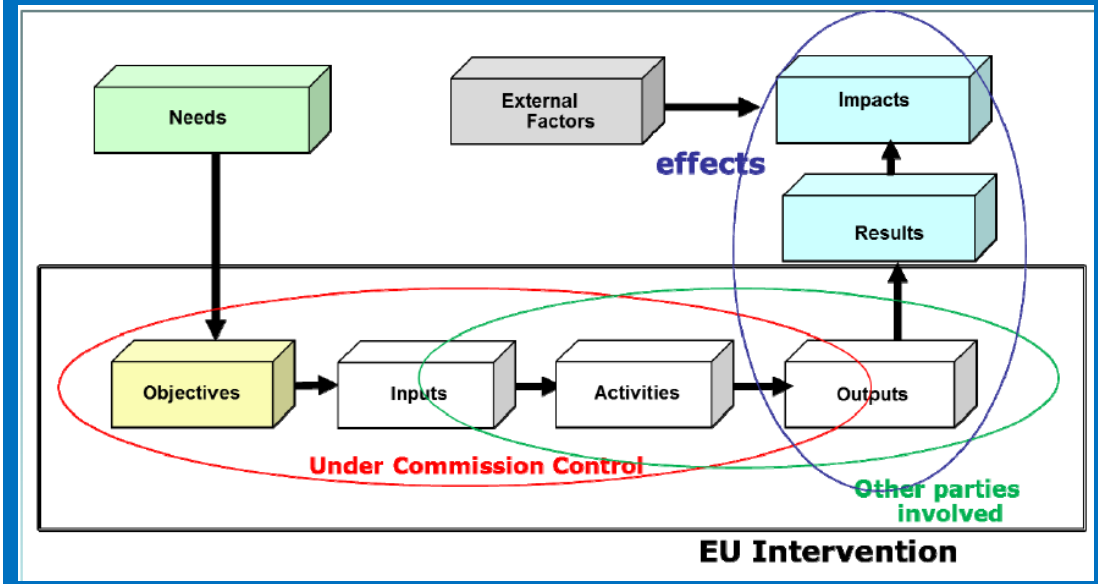
1.2.2 Conceptual overview

We define 'results' in broad terms to include any climate-relevant results or impacts (see Box 1 below) that have arisen from programme expenditure, or the application of the relevant financial instrument. In practice, and as described in subsequent sections of this report, the definitions that are used for results and impacts are not always applied consistently across all budget programmes. To accommodate this, the review has captured all of the different types of metrics for the climate related results, which also includes metrics that are more representative of the programme outputs.

It is also important to recognise that there may be a time lag between the outputs and the associated results, and between the results and the associated impacts. For some budget programmes these effects are represented through the use of indicators which reflect more short-term and more direct results, and other indicators which represent longer-term impacts, which might also be less direct (e.g. at the policy level).

Box 1. Intervention logic for a programme

The intervention logic for a programme describes the causality for programme – showing how an intervention was triggered by a certain set of needs or problems occurring within a certain context and how it was designed, with the intention of producing the desired changes. This includes a description of the inputs, activities and outputs, along with the expected results and impacts. Indicators may be defined for the programme for different parts in the intervention logic, in order to monitor performance over time.



Source: Better Regulation Guidelines. SWD(2015) 110 final

To monitor results and impacts, it is necessary to establish indicators. These should have policy relevance, be robust (for reporting and for use in further analysis), and be based on measurable data (i.e. readily available and good quality data) (principles established for the design of environmental indicators by the OECD, 1993)[250]. Depending on data availability and the level of complexity in what needs to be monitored, indicators can be used individually, within a matrix (combining multiple indicators), or as part of a set (aggregating indicators) (EEA, 2014)[251]. The European Environmental Indicator Metadata Catalogue provides a comprehensive list of environmental indicators and provides

[250] OECD (1993) OECD core set of indicators for environmental performance reviews. A synthesis report by the Group on the State of the Environment, OECD Publishing.
[251] EEA (2014) Digest of EEA indicators 2014.

a framework for identifying and assessing inconsistencies in naming and overlaps between indicators (last update 31 March 2017)[252]. Climate relevant indicators listed in this catalogue are presented in Appendix 1.

[252] http://ec.europa.eu/eurostat/web/environment/overview/environmental-indicator-catalogue

2 Methodology

The methodology that was followed in the implementation of the study is described below. A similar approach was followed for each of the different stages in climate tracking framework: inputs, outputs and results.

2.1 Selection of the budget programmes and financial instruments

An initial step in the analysis involved the selection of the specific budget programmes and financial instruments to be analysed in more detail.

While mainstreaming climate change considerations is important for all areas of the budget, in practice the potential for different areas of expenditure to deliver greenhouse gas (GHG) savings, or increase climate resilience, will vary considerably between the different budget programmes and financial instruments. It was therefore agreed that the review should focus on those areas of the budget that are expected to have the most significant climate-related impacts, since this is where the need for robust approaches to climate tracking are most important.

The budget programmes were selected on the basis of their relative contribution towards the total climate-related expenditure, as reported in the Staff Working Document accompanying the Mid-term Review of the MFF (SWD(2016)299)[253]. More specifically, all budget programmes with an expected climate-related expenditure of >1 000 million Euro, over the 2014-2020 programming period, were included in the in-depth analysis (see annex 3). These cover 99.6 % of the total EU budget for 2014-2020.

The financial instruments (FIs) were also selected based on relative volume of funding, although this was based on total EU contribution to the FIs in question due to a lack of data on climate-relevant funding. The selection was then refined based on a qualitative assessment of the climate relevance of the FIs e.g. if the instruments has an explicit objective to address climate change, and/or are targeted on a sector that is clearly climate relevant. Finally, the selection was refined to ensure that it captured a representative sample of the different instrument types / designs that the EU budget supports, as well as to include selected instruments with strong climate relevance but which did not meet the investment volume threshold (see annex 4).

2.1.1 Data collection

The data collection process aimed to capture the following information:

- Specific monitoring and reporting requirements and procedures for climate-relevant elements of the EU budget -This includes requirements in relation to both positive and negative (in climate terms) areas of the budget.
- Performance indicators and other metrics used in the monitoring and reporting of climate-relevant elements of the budget.
- Methodological frameworks used in the assessment of performance of climate-relevant elements of the budget.
- Guidance for the development and implementation of indicators and monitoring frameworks.
- Results data on climate-relevant elements of the budget.

2.1.2 Data analysis

The information gathered for each of the individual budget programmes and FIs was synthesised and further analysed in order to:

- Assess the relevance of the current indicators and approaches;

[253] Commission Staff Working Document *Accompanying the document* Communication from the Commission to the European Parliament and the Council – Mid-term review/ revision of the multiannual financial framework 2014-2020. An EU budget focussed on results. SWD(2016)299. Brussels, 14.9.2016.

- Identify gaps, overlaps and discrepancies with the current approaches;
- Gather results data, and as far as possible quantify the GHG impacts of the current MFF.

The various indicators, methodological frameworks and guidance documents were mapped against each of the budget programmes and FIs, and then further compared with each other. This was used to identify potential gaps and inconsistency in the current approaches to tracking, but also particular strengths (e.g. best practice), and areas requiring further strengthening.

A broader review was also performed of selected methodologies, tools and guidance used outside the EU, in order to identify best practice from elsewhere.

2.1.3 Development of options for improvements

Drawing on the analysis of the tracking framework for the current MFF, and in particular the problem areas requiring strengthening, a series of options were then developed for strengthening the monitoring and reporting framework.

Options were identified for each of the problem areas identified in the earlier analysis. These considered both content issues for the monitoring and reporting (e.g. what needs to be reported) but also process issues (e.g. how to report the information).

The performance of each of the options was evaluated against a consistent set of criterion. These were:

- Effectiveness – in addressing the underlying problem areas
- Efficiency – including the cost/effort involved
- Feasibility – of implementation in practice (in terms of technical feasibility and political acceptance)
- Coherence – between the different elements of the budget
- EU added value – in measuring the results of EU actions, and in the need for action at EU level

Following the evaluation of the individual sub-options, the most promising options were then grouped together into an overall package of recommended improvements.

2.1.4 Simulation of the GHG profile

For certain budget programmes and FIs quantitative information has been reported for the specific performance indicators. This includes information for the climate-relevant indicators. This information was compiled across each of the programmes and FIs, in order to provide a first estimate of the total GHG impacts of the EU budget.

3 Analysis

This section provides the findings from the review of the existing approaches within the current MFF for tracking climate-relevant results[254]. The findings are presented first for the review of the climate-relevant indicators, and then for the review of guidance and/or methodologies that has been prepared to support the reporting of the indicators.

3.1 Climate-related indicators

The EU budget sits within the wider framework established by the Budget Focussed on Results (BFOR). This framework sets out the strategic need for indicators to help achieve a budget which is more focussed on results whereby expenditure is directly linked to targets and milestones and indicators are needed to track progress towards these objectives[255].

As part of this framework, it is logical that where a budget programme has a specific climate-related objective, it would also have indicators defined to monitor progress against the objective.

3.1.1 Overview of common indicator frameworks

3.1.1.1 Budget programmes

For all of budget programmes examined as part of the study, high-level climate-related objectives were identified. The specific nature of the objectives varied by budget programme. In some cases the budget programmes had specific objectives relating to the move towards a low carbon economy or the promotion of climate change adaptation; in other case climate change actions were recognised in the spending priorities. Further details on the approaches taken to mainstream climate change considerations in the different budget programme is provided in Annex report 2.

For the majority of budget programmes (ERDF, CF, EMFF, EAFRD, EAGF, LIFE, Horizon 2020, CEF, DCI, ENI, IPA II and EDF), common frameworks for the development and monitoring of climate related indicators have been established alongside the indicators, as part of Union legislation. In some cases common frameworks have been developed across several budget programmes e.g. the common indicators used by ERDF and CF regulations. For other budget programmes, the common framework just covers the investments within that budget programme.

In two cases (ESF, Copernicus) it was found that while the programme legislation includes climate related policy objectives, no associated framework or guidance pertaining to the development of related indicators has been developed. This represents a potential gap in the current monitoring and reporting framework, although the actions taken under these specific budget programmes are expected to have a less direct impact on climate mitigation or adaptation.

As with the objectives, there is also variability in the climate-related indicators that are defined under the common frameworks. The specific indicators that are used by the individual budget programme areas are explored in the next section.

An overview of the common frameworks is provided in the table below.

[254] Analysis of the findings with respect to the tracking of climate-relevant inputs and outputs are presented in separate stand-alone reports
[255] http://ec.europa.eu/budget/budget4results/initiative/index_en.cfm

Table 3-1 Common frameworks for the development of climate related indicators

	Legal provisions	High-level climate related objective	Indicator types
ERDF (1301/2013)[256] CF (1300/2013)[258]	Provisions in the programme specific legislation require that for programme-specific result indicators, which relate to investment priorities, baselines shall use the latest available data and targets shall be set for 2023. Further guidance is adopted by Commission Delegated Regulation (EU No. 480/2014) in general terms relating to the setting of indicators and monitoring. This Regulation relates to all funds within the ESIF.	Supporting the shift towards a low-carbon economy, promoting climate change adaptation and promoting resource efficiency are identified as investment priorities for both the ERDF and CF.	The following definitions are used for the ERDF and CF (European Commission, 2014)[257]: **Results** are a specific aspect of progress achieved (programme specific) **Outputs** are the direct products of the programmes (both common and programme specific) **Output** indicators for climate mitigation and adaptation actions are defined at EU level with the option to develop programme specific indicators to accompany them. Common output indicators should be accompanied by programme specific **result** indicators.
ESF (1304/2013)[259]		Supporting the shift towards a low-carbon economy is classed as a secondary thematic objective. This means that the ESF does not target this objective but that in meeting in its primary objectives, the funding is expected to contribute towards this shift.	No climate related indicators.

[256] Regulation (EU) No 1301/2013 of the European Parliament and of the Council of 17 December 2013 on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006
[257] European Commission (2014) Guidance document on monitoring and evaluation – European Cohesion Fund and European Regional Development Fund. Concepts and Recommendations.
[258] Regulation (EU) No 1300/2013 of the European Parliament and of the Council of 17 December 2013 on the Cohesion Fund and repealing Council Regulation (EC) No 1084/2006.
[259] Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006

	Legal provisions	High-level climate related objective	Indicator types
EMFF (508/2014)[260]	Provisions in programme legislation specify that common indicators shall be developed. A framework has been established – FAME, Fisheries and Aquaculture Monitoring and Evaluation under the EMFF[261].	Among its objectives the EMFF aims to support technological development and innovation in energy efficiency and knowledge transfer - other objectives may be of relevance to climate but not directly	Results are categorised as outputs and results. These terms are not defined by the regulation. A common framework for developing, implementing and reporting **output** and **result** indicators has been developed which includes climate mitigation actions.
EAFRD (1305/2013)[262]	Provisions to establish common indicators are specified the programme legislation and these are defined in legislative acts (No. 808/2014 and No. 834/2014).	Under EAFRD there are a number of Focus Areas intended to contribute to climate mitigation and adaptation, particularly under the priority headings 4 (Restoring, preserving and enhancing ecosystems related to agriculture and forestry) and 5 (Promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors).	Indicators are categorised as outputs, results, and impacts. These are defined as follows: **Outputs**: Reflecting the implementation of the related CAP instruments. **Results**: Reflecting the main achievements. **Impacts**: Reflecting the areas where the CAP is expected to have an influence.
EAGF (1307/2013)[263]	Provisions to establish common indicators is specified the accompanying programme legislation (Horizontal Regulations) and these are defined by legislative act (No. 834/2014). Indicators are defined for outputs, results and impacts.	Climate objectives are an underlying feature of the EAGF - tied to the greening component of direct payments and the horizontal environmental conditions and standards set by cross compliance	A framework of common **output**, **result** and **impact** indicators has been developed and mapped to each of the relevant climate-related objectives. The framework also includes context indicators to reflect the general contextual trends that are expected to affect implementation, achievements and performance of the CAP.

[260] Regulation (EU) No 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund and repealing Council Regulations (EC) No 2328/2003, (EC) No 861/2006, (EC) No 1198/2006 and (EC) No 791/2007 and Regulation (EU) No 1255/2011 of the European Parliament and of the Council
[261] http://ec.europa.eu/fisheries/cfp/emff/fame_en
[262] Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005
[263] Regulation (EU) No 1307/2013 of the European Parliament and of the Council of 17 December 2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No 637/2008 and Council Regulation (EC) No 73/2009

	Legal provisions	High-level climate related objective	Indicator types
LIFE (1293/2013)[264]	General performance indicators are specified by the legislation and provisions further state that specific qualitative and quantitative outcomes, indicators and targets for each priority area and type of projects shall be adopted by Implementing Decision for each Multiannual Work Programme.	There is a dedicated sub-programme to climate action under LIFE with objectives set out against mitigation actions, adaptation actions, and climate governance and information.	A combination of quantitative and qualitative **outcome** indicators have been developed with respect to each of the three priority areas to capture expected **results** and **impacts**.
Horizon 2020 (1291/2013)[265]	Provisions to establish key performance indicators do not specify the need to establish one for climate actions as climate is regarded as a cross-cutting issue. Common KPI are included in the legislation.	Under Article 14, a number of cross-cutting issues are identified which shall receive particular attention, including: "climate change and sustainable development".	There are several recognised difficulties in monitoring impacts and results arising from a cross cutting objective, particularly where the activity funded is not intended to deliver concrete climate impacts or results. Thus, the indicator developed monitors climate related **expenditure**.
CEF (1316/2013)[266]	Output indicators related to climate actions are specified in the programme legislation. Indicators are linked to the programme objectives and a unit for measurement is specified but no instruction on determining the baseline scenario is included.	Climate is a cross-cutting objective which is included among the list of "general orientations to be taken into account when setting the award criteria" for operational progammes. Specifically: "when applicable, the economic, social, climate and environmental impact, and accessibility".	Climate related **output** indicators have been developed for adaptation and mitigation actions in relation to energy projects. Outputs are defined as achievements. In addition to reporting against common indicators, the Commission is required to report on both for the mid-term and ex-post evaluations of the programme.
Copernicus (377/2014)[267]	No climate related indicators are specified by the programme legislation.	Copernicus does specify that it should contribute to supporting the protection of the environment, and to smart,	No climate related indicators have been identified

[264] Regulation (EU) No 1293/2013 of the European Parliament and of the Council of 11 December 2013 on the establishment of a Programme for the Environment and Climate Action (LIFE) and repealing Regulation (EC) No 614/2007 Text with EEA relevance
[265] Regulation (EU) No 1291/2013 of the European Parliament and of the Council of 11 December 2013 establishing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020) and repealing Decision No 1982/2006/EC Text with EEA relevance
[266] Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010 Text with EEA relevance
[267] Regulation (EU) No 377/2014 of the European Parliament and of the Council of 3 April 2014 establishing the Copernicus Programme and repealing Regulation (EU) No 911/2010 Text with EEA relevance

	Legal provisions	High-level climate related objective	Indicator types
		sustainable and inclusive growth.	
DCI (233/2014)[268] ENI (232/2014)[270] EDF (2015/322)[271]	The Commission shall report on results achieved using measurable indicators reflecting the specificities and objectives of the funding programme concerned. This is established in a common framework for implementation of external finance within the MFF Results tracking for these three budget programmes sits within the results framework established for EU external expenditure (EU International Cooperation and Development Results Framework, SWD(2015)80). This framework includes the DCI, ENI and EDF along with other programmes of limited relevance to climate related actions (European Instrument for Democracy and Human Rights, Instrument contributing to Stability and Peace, Instrument for Nuclear Safety Cooperation, and the Instrument for Greenland).	The framework is structured with three levels: Level 1: Looks at impacts and outcomes as a measure of development progress in partner countries over a long timeframe. The purpose of this monitoring and reporting is to set the operational context in which the results of EU external assistance should be seen. Indicators at this level at determined at international level (e.g. millennium development indicators). Level 2: Looks at development outputs and direct outcomes – linked to EU projects and programmes. Results identified at level 1 are associated to those included at level 2 – although should be treated as contextual indicators. Level 3: Looks at organisational performance (i.e. to see how DG NEAR is managing operational processes) All three programmes include climate related objectives at Level 1 to provide operational context in which the results of EU external finance should be seen.	The common framework for external finance specifies that indicators shall be developed to monitor and report **outcomes** and **outputs** to determine the **results** of the funding programme. Reference is made to the OECD-DAC principles for developing indicators and monitoring. However, no common indicators are defined in the framework[269].

[268] Regulation (EU) No 233/2014 of the European Parliament and of the Council of 11 March 2014 establishing a financing instrument for development cooperation for the period 2014-2020
[269] DEVCO are in the process of updating the framework in order to be aligned with the SDG indicator framework
[270] Regulation (EU) No 232/2014 of the European Parliament of the Council of 11 March 2014 establishing a European Neighbourhood Instrument.
[271] Council Regulation (EU) 2015/322 of 2 March 2015 on the implementation of the 11th European Development Fund.
European Commission (2016a) DG DEVCO climate change and environment mainstreaming activities and support services.

	Legal provisions	High-level climate related objective	Indicator types
IPA II (231/2014)[272]	Results tracking for the IPA II does not sit within the results framework established for EU external expenditure. However, a performance framework has been established which is consistent the EU results framework for external finance, as outlined above	No climate related indicators are specified in the budget programme legislation – although guidance on their development is available (referred to in the subsequent section)	No climate related indicators are specified – examples of climate related indicators in the guidance include both output and impact (DG NEAR, 2016)[273]

[272] Regulation (EU) No 231/2014 of the European Parliament and of the Council of 11 March 2014 establishing an Instrument for Pre-accession Assistance (IPA II)
[273] DG NEAR (2016) Guidelines on linking planning/ programming, monitoring and evaluation.

3.1.1.2 Financial instruments

Public FIs are designed to facilitate the mobilisation of additional funds, to increase the level of investment in climate change projects, many of which have some difficulties in accessing standard sources of finance. The performance of FIs are therefore typically measured in relation to the leverage effect (defined as the amount of finance made available to the final recipient divided by the amount of EU funds provided) or a revolving effect (whereby an amount of finance is returned to the EU fund from the original value). The legislative framework for tracking results of FIs focusses on the financial performance of the FI rather than the climate performance – an overview is presented in the table below.

The tracking of the overall climate-related results of investments made through FIs is also made more difficult as the results are typically monitored and reported at project level. There are few examples of FIs with climate related indicators developed – at project level – however, these are not consistently used across FIs. These examples are also focussed on ex-ante project expectations rather than actual project/ loan results and impacts. No examples have been found to date of FIs which have tracked the results of the projects they help finance (although this appears to be the intention for one of the LIFE financial instruments, the Private Finance for Energy Efficiency, PF4EE).

The nearest that exists is indications of the need / obligation to do mid-term and ex-post evaluations of EU programmes that include FIs (for example H2020, COSME, ESIF). In these evaluations it can be assumed that the climate relevant spending of the FIs parts would be considered. However, this will need to be investigated on an anecdotal basis as there does not appear to be any tracking system or requirement in place to systemise this aspect of the evaluation. The FIs can be presumed to track and monitor which projects repay the loans, but this data is not made public (especially not on a loan by loan basis).

Table 3-2 Common frameworks for climate related indicators used for financial instruments

Theme	Financial instrument	Legal provisions	High-level climate related objective	Related indicators
Research and innovation	Horizon 2020 Loans service	None identified	None identified	No climate related indicator identified.
	InnovFin SME guarantee			
	InnovFin SME venture capital			
Infrastructure, climate, environment and energy efficiency	Connecting Europe Facility (CEF) – Debt instrument	None identified	None identified	No climate related indicator identified.
	CEF – Equity instrument			
	Private Finance for Energy Efficiency Instruments (PF4EE)	General performance indicators are specified by the LIFE legislation.	PF4EE is a dedicated FI to energy efficiency, contributing to mitigation efforts. NCFF objectives are wider and include all aspects of natural capital, including climate action components.	A combination of quantitative and qualitative **outcome** indicators have been developed with respect to each of the three priority areas to capture expected **results** and **impacts**.
	Natural capital financing facility (NCFF)			
	Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) – The Loan Guarantee Facility (LGF)	None identified	None identified	No climate related indicator identified
	Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) – The Equity Facility for Growth (EFG)			
Enlargement countries	Guarantee facility - Western Balkans Enterprise Development and Innovation facility (EDIF GFI)	n/a	Projects are encouraged to consider climate adaptation particularly in relation to water supply, hydro energy production and energy use.	No climate related indicator identified. Guidelines for integrating climate change were included in the general guidance but not for monitoring and reporting results.
	Enterprise Expansion Fund (ENEF) (under EDIF)			
	Enterprise Innovation Fund (ENIF) under EDIF			

Theme	Financial instrument	Legal provisions	High-level climate related objective	Related indicators
	Guarantee facility II – Western Balkans Enterprise Development and Innovation facility (EDIF GFI II)			
	European Fund for Southeast Europe (EFSE)	n/a	None identified	No climate related indicator identified
	Green for Growth Fund (GGF)	n/a	Loan – to contribute to 20 % reduction in energy consumption and/ or 20 % reduction in CO2 emissions	Loan applications must include assessments of environmental and social impacts which are then reviewed (at preconstruction, construction, operation and decommissions/closure). This must consider GHG emissions and any climate change mitigation or adaptation issues. Performance takes into account mitigation impact but no indicators are specified.
	Global Energy Efficiency and Renewable Energy Funds (GEEREF)	n/a	Intended to support climate actions	Quantitative and qualitative indicators are specified to monitor and report climate performance against achievements.
Neighbourhood countries	Facility for Euro Mediterranean Investment Partnership (FEMIP)	n/a	None identified	Guidance on developing climate related indicators is provided by the Commission for all Facility instruments. Performance indicators specified by legislation relate to financial performance and not climate.
	Development Cooperation Instrument (DCI)	None identified	Detail provided in relation to the budget programme – see previous table	
	Investment Facility for Central Asia (IFCA) and Asian Investment Facility (AIF)	None identified	None identified	
	Latin American Investment Facility (LAIF) (2014-20)	None identified	None identified	
Financial Instruments under the	ERDF and CF	Provisions to establish compulsory indicators for the use of FIs under the	Detail provided in relation to the budget programme – see	Apart from the common indicators proposed, no specific indicators on climate change for financial instruments. Nevertheless, it is
	ESF			

Theme	Financial instrument	Legal provisions	High-level climate related objective	Related indicators
European Structural and Investment Funds (ESIF) (2014- 20)	EAFRD EMFF	ESIF budget programmes relate to financial performance rather than climate performance (966/2012)[274]	previous table	possible to track what amounts are dedicated to climate change through financial instruments with the categories of intervention (financing mode).
Others (2014-20)	European Fund for Strategic Investment (EFSI)	Provisions to establish indicators relate to financial performance rather than climate performance	Aims to contribute to EU efforts to meet its climate objectives.	Climate mitigation impact should be monitored in terms of the carbon footprint of the project in accordance with EIB requirements. No climate related indicators are specified in the EFSI legislation.
	European Development Fund (EDF) Blending Framework: Africa Investment Facility (AfIF); Caribbean Investment Facility (CIF); Investment Facility for the Pacific (IFP)	n/a		Guidance on developing climate related indicators is provided by the Commission for all Facility instruments. Performance indicators specified by legislation relate to financial performance and not climate.

[274] Regulation (EU, EURATOM) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, EURATOM) No 1605/2002)

3.1.2 Mapping of specific climate-related indicators

The specific indicators which are used by the individual budget programmes and FIs are mapped in the tables below.

As described above, the budget programmes have, to some extent, adopted different sets of common indicators. Moreover, there are differences in the definitions that have been used for outputs, results and impacts across the budget programmes.

The most widely used climate-related indicators are **output** indicators. An overview of common output indicators related to climate actions and included in the annual reporting of the respective budget programmes is presented in the table below – note that it doesn't include proxy indicators. Note that in the case of the Common Agricultural Policy (CAP) (comprising EAGF and EAFRD) more detail is provided in the appendix of this report concerning the framework for the development of the indicators listed below which is intended to present an overview. In addition, for Horizon 2020 the list does not include the common performance indicators that have been developed for certain sub areas. Further details on the indicators that are used for the energy efficiency and system integration projects supported under H2020 are described in the next section.

Table 3-3 Overview of output indicators related to climate action as reported in the annual programme statements

Type of indicator	Related funding programme
Patent applications in the area of climate related actions	H2020
Publications in peer-reviewed in the area of climate related actions	H2020
Number of projects/ plans/ strategies supported in the areas of climate related actions	CEF; LIFE (includes several types of projects); DCI*
Projects improving climate resilience	CEF (access to reliable energy supply); ERDF and CF (population benefiting from flood protection or fire protection measures); LIFE (includes several types of projects)
Number of deployed smart grids	CEF
% of CAP payments (measured by '000 subject to cross compliance under single area schemes and basic payment schemes) covered by cross compliance	EAGF
Additional capacity of renewable energy production	ERDF; CF
Number of households with improved energy consumption classification	ERDF; CF
Decrease of annual primary energy consumption of public buildings	ERDF; CF
Number of additional energy users connected to smart grids	ERDF; CF
Estimated annual decrease of GHG	ERDF; CF
Support expressed by the public on cross compliance as a mechanism to support the reduction of direct payments of farmers not complying with environmental rules	EAGF
Control rate for Good Agricultural and Environmental Condition (GAEC)	EAGF
The ratio of permanent pasture within a Member State in relation to the total agricultural area	EAGF
Share of area under greening practices	EAGF
Payment for agricultural practices beneficial for the climate and the environment (ha to be paid in '000)	EAGF
Agricultural land under management contracts to improve water management (million hectares)	EAFRD (Union Priority 4)†
Agricultural land under management contracts to improve soil management and/ or prevent soil erosion (million ha)	EAFRD (Union Priority 4)
Irrigated land switching to more efficient irrigation systems (million ha)	EAFRD (Union Priority 5)

Agricultural land under management contracts targeting reduction of GHG and/or ammonia (ha)	EAFRD (Union Priority 5)
Livestock units concerned by investments in life-stock management in view of reducing the GHG and/or ammonia emissions	EAFRD (Union Priority 5)
Agricultural and forest land under management contracts contributing to carbon sequestration or conservation	EAFRD (Union Priority 5)
Number of investment operations in physical assets in view of facilitating the supply and use of renewable sources of energy	EAFRD (Union Priority 5)
Number of investment operations in physical assets in view of increasing efficiency in energy use in agricultural and food processing	EAFRD (Union Priority 5)
Number of interventions to ensure better governance, dissemination of information and awareness of environmental and climate aspects	LIFE
Number of interventions to improve the knowledge base for Union climate policy and legislation, and for assessing and monitoring factors, pressures and responses having an impact on the climate	LIFE
Number of stakeholders and citizens participating in awareness raising activities in the framework of LIFE interventions	LIFE
Number of interventions emanating from NGOs funded by LIFE with an impact on EU policy	LIFE
Number of interventions achieving synergies with or mainstreamed into other Union funding programmes, or integrated into public or private sector practice	LIFE
Number of projects/ plans/ strategies supported in the areas of climate related actions outside the EU	DCI*

*Table notes: *DCI is used to fund external climate actions. †Additional output indicators are reported against under Union Priority 4 of EAFRD which have not been included here as they relate specifically to biodiversity. Energy intensity of the economy (as a proxy indicator for Energy savings) is under development with respect to the ERDF and CF (European Commission, 2016).*
Source: European Commission (2016)[275]

It is clear from the table above that the budget programmes apply a range of different outputs indicators, and there is only limited harmonisation across the different programme areas. Exceptions are the indicator *Number of projects/ plans/ strategies supported in the areas of climate related actions,* which is used by CEF, LIFE and DCI, and *Projects improving climate resilience*, which are used by CEF, ERDF, CF and LIFE. However, most other indicators are used by just a single budget programme. Moreover, even though these indicators are used across different budget programmes, the nature of the projects covered, and their resulting impacts, are likely to be very different between budget programmes.

The use of tailored output indicators is, however, well-justified since these reflect the different nature of the programmes and their specific objectives. For example, the indicators that are used by H2020 reflect the focus on this programme on research outputs; these indicators would not necessarily be relevant for other budget programmes such as CEF which is focussed much more on large scale infrastructure investments. Likewise, the output indicators that are used for EAGF and EAFRD reflect of the specific actions that are taken under these programmes in the agriculture sector, and would not be representative of the actions taken under other programmes in other sectors. The indicators also reflect the different types of investment made within a budget programme. For example, in the case of the LIFE programme, different indicators are used depending upon whether the projects are technical assistance projects or capacity building projects. Therefore, while the inconsistency in the climate-relevant indicators that are used by the budget programmes makes it difficult to compare the outputs from the programmes on a consistent basis, the use of tailored indicators is necessary so that the

[275] European Commission (2016) Draft general budget of the European Commission for the financial year 2017. Working document Part I – Programme Statements of operational expenditure.

indicators adequately reflect the different types of activities that are supported under each programme.

Alongside the output indicators, the common frameworks for some budget programmes also include **results/impact indicators**. An overview of the climate related result and impact indicators are presented in the table below.

Table 3-4 Types of result and impact indicators developed for the funding programmes reviewed in this study (excluding FIs)

Type of indicator	Related funding programme	Comment
Volume of avoided curtailment of renewable energy	CEF	Overlap with capacity of renewable energy production
GHG emissions savings	CEF; ERDF; CF; CAP (EAFRD and EAGF); DCI; LIFE	Linked to output indicators since, for example, some of the GHG savings will be delivered as a result of the increased renewable energy capacity.
Fuel efficiency of fish capture	EMFF	Overlap with energy intensity

Note: For ERDF/CF "Estimated annual decrease of GHG" is defined as an output indicator, as shown in Table 3-3 above. However, to support the comparison with other programmes, we have also included this indicator in the table above.

As with the output indicators, there is some variability in the results indicators between the budget programmes, but overall strong commonality. In particular, the indicator *GHG emission savings* is used by most of the budget programmes. This suggests a relative high level of harmonisation already across budget programmes. However, as discussed in the next section, harmonisation is also required across methodologies that are used to calculate the indicators in order to ensure the full comparability of the respective indicators.

Some budget programme use indicators relating to the main activities that are associated with the GHG savings (which are applied by some programmes as output indicators and others as results indicators) such as increases in renewable energy production, or energy savings. However, there is some apparent inconsistency in how these indicators are framed. For examples, in relation to renewable energy, CEF uses the indicator *Volume of avoided curtailment of renewable energy* whereas ERDF/CF use the common (output) indicator *Additional capacity of renewable energy production.* Likewise, in relation to energy efficiency measures, ERDF uses, for example, *Decrease of annual primary energy consumption of public buildings,* whereas EMFF uses *Fuel efficiency of fish capture.* Therefore, there may be some potential for further harmonisation or streamlining of these indicators further. This could involve harmonisation on the basis of absolute energy savings (in either primary or final energy terms) or in relation to the % improvement in energy intensity (but relative measurements can be problematic in adding further complexity). Harmonisation on the basis of absolute saving would also facilitate cross-checking with the estimates GHG impacts.

It is also notable that there are currently no indicators that reflect results/impacts of climate change adaption actions – although there are some output indicators relating to climate resilience. This is perhaps unsurprising given that the results from adaptation and resilience measures in practice are highly context-specific, depending on the particular risks and vulnerabilities in the geographic area of projects under consideration, as well as the nature, lifetime, and risk management process of the project. However, this does limit the ability to assess the impacts of the EU budget as whole on the EU's climate adaptation objectives.

3.2 Guidance and methodologies for the development of climate-relevant indicators

For some budget programmes, additional guidance has been developed to support the development of consistent indicators.

The nature of the guidance depends to some extent on the specific mode of management of the budget programmes. For example, for those budget programmes and FIs under direct management

guidelines have been developed to support project beneficiaries with the development of indicators in a consistent manner. In contrast, for budget programmes under shared or indirect management the guidelines are intended to support Member States with the development of indicators in a consistent manner (where operational programme specific indicators are needed).

An overview of the guidance documents is provided in the table below. For several budget programme specific guidance relating to the development climate change indicators was identified, but not for all. This may suggest a potential gap in the monitoring and reporting system for these budget areas in relation to climate-related results tracking.

Table 3-5 Overview of available guidance for indicator development

Programme	Accompanying guidance	Main elements of the guidance
ERDF CF	Supporting guidelines to define energy and climate change indicators (European Commission, 2014)[276]	The guidance is intended to support **Member States** with the development and implementation of their operational programme specific indicators. Guidance lists and describes energy and climate indicators which could be used. Where necessary explanations are provided with additional details. E.g. the guidance explains how the end value should be calculated, and sets out the scope of what should be included in the measurements.
ESF	Supporting guidelines do not refer to climate change indicators (European Commission, 2016)[277]	n/a
EMFF	Guidance on how to mainstream climate actions with the EMFF were developed and refer to the use of indicators to achieve this (European Commission, 2013)[278]. No guidance on developing or implementing climate specific indicators has been identified though.	n/a
EAFRD EAGF	Detailed guidance to support managing authorities with the implementation of the above regulations was developed by the Commission and is accompanied by a shorter handout version (2015)[279]. Guidance on developing impact indicators was developed by the Commission (European Commission, 2015)[280].	The guidance is intended to support **Member States** with the development and implementation of their operational programme specific indicators. The guidance lists and describes energy and climate indicators which could be used.
LIFE	Detailed guidance is available relating to the development and implementation	Guidance is provided to **project beneficiaries** on the quantification

[276] European Commission (2014) Guidance document on monitoring and evaluation. European Cohesion Fund and European Regional Development Fund. Concepts and Recommendations.
[277] ESF Support Centre (2016) Programming Period 2014-2020. Monitoring and Evaluation of European Cohesion Policy, European Social Fund. Guidance document. Annex D - Practical guidance on data collection and validation.
[278] European Commission (2013) Commission Staff Working Document. Principles and recommendations for integrating climate change adaptation considerations under the 2014-2020 EMFF operational programmes. SWD (2013) 299.
[279] http://ec.europa.eu/agriculture/sites/agriculture/files/cap-2014-2020/monitoring-evaluation/leaflet-monitoring-evaluation-framework-cap-2014-2020_en.pdf
[280] http://ec.europa.eu/agriculture/sites/agriculture/files/cap-indicators/impact/2015-05-06-impact-indicators_en.pdf

Programme	Accompanying guidance	Main elements of the guidance
	of climate related indicators (European Commission, 2015)[281]	of the indicators. The guidance identifies common indicators, defines the indicator and provides links to established guidance.
Horizon 2020	Guidance on the development and implementation of indicators is established with reference to how climate indicators should be developed (European Commission, 2015)[282]. Guidelines on the calculation of Common Performance Indicators for projects supported under the Intelligent Energy Europe Programme include indicators relating to reduction of greenhouse gases[283].	Guidance is provided to **project beneficiaries** on the quantification of the indicators. The guidance identifies common performance indicators, defines the indicator and describes a recommended approach to estimate the indicators.
CEF	No guidance has been identified.	n/a
Copernicus	No guidance has been identified.	n/a
DCI ENI IPA II	EU International Cooperation and Development Results Framework (SWD(2015) defines the relevant indicators to be used. Three levels of indicators have been defined. The OECD-DAC has guidance on the development of results indicators which includes climate specific ones of relevance to these funding programmes; moreover, examples of programme specific indicators have been reviewed in this analysis. Further, aspects of the guidance developed for the CAP will be relevant to the agricultural component within the IPA II.	The results framework describes the mechanisms in support of the reporting process and details the indicators of the EU RF against which DG International Cooperation and Development will report annually as of 2015 to demonstrate how funds spent contribute to the achievement of the policy objectives. Methodological notes for all level 1 and 2 indicators have been developed. These specify the data sources and explain the aggregation process, including, where necessary, how to weight numbers. Level 2 reporting is based either on information from national statistical systems or specifically collected from project and programme monitoring mechanisms.

3.3 Guidance and methodologies for the calculation of climate-relevant indicators

Alongside the documents described above to provide guidance on the *development* of indicators, the review also considered guidance and associated tools for the *calculation* of climate-relevant indicators. In many cases these guidance documents cover similar ground, or form part of the same documents, as the guidance on indicator development described above.

Guidance on the calculation of climate-relevant indicators is important for ensuring that where indicators are reported, the methodologies and/or data that are used to derive the indicators are consistent, and comparable. These guidelines may therefore include technical issues such as the emission factors to be used in the calculations.

[281] European Commission (2015) Qualitative and quantitative outcome indicators for LIFE projects. General Guidance.
[282][282] European Commission (2015) Horizon 2020 indicators. Assessing the results and impact of Horizon 2020.
[283] Guidelines for calculations of IEE Common Performance Indicators. (EACI, 2013a)

Guidance is particularly important where reporting against the indicators is more complex or requires some calculations to be performed. This is generally the case with the monitoring and reporting of climate-relevant results. There are a number of reasons why the calculation of climate results is more complicated than, for example, the reporting of the inputs (i.e. climate relevant expenditure). Some of the main reasons are summarised in the Box below.

Box 2: Challenges with the calculation of climate-related results

Challenges with the calculation of climate-related results

There are a number of technical challenges associated with the quantification of climate relevant results. These include the following.

- The results are further along the intervention logic chain, so any estimate of the results of a budget programme first requires a robust estimate of the inputs, activities and outputs of the programme. Likewise, uncertainties in these early parts of the logic chain will be magnified when it comes to the calculation of the climate-related results.
- Impacts happen as a result of a diverse range of activities undertaken in response to the programmes/instruments. In accordance with the intervention logic for the respective programmes and instruments, the results arise as a result of the programme activities. These activities can be very diverse in nature, even within the same sector, and therefore quantification of the impacts may require methodologies to be developed for each of the different types of activities. This diversity is illustrated by the wide range of output indicators that have been developed for the budget programmes analysed as part of this study.
- The resolution at which impacts may be assessed may vary from one instrument to the next. At one extreme, the climate impacts may be quantified for the individual projects supported by the budget programme. This is typically the case where the activities supported are specific large scale projects, where there is a high level of confidence of the activities that will be carried. In these cases the climate impacts are generally quantified at project level. At the other extreme is where the budget programme is used to support a diverse range of activities across multiple agents, and the individual impact of the activities may be small[284]. In this case the impact may be assessed at an aggregated or programme level, using some simplistic assumptions for the portfolio of projects.
- Not all impacts will arise in the same timeframe. While input (expenditure) and to some extent outputs (mobilised finance) can be defined within a specific timeframe i.e. when payments are made, this is not the case for the climate impacts. For example, in the case of support from Horizon 2020 for demonstration of first-of-a kind (FOAK) technologies, there will be a short term impact from the projects that are supported directly, but also long term impacts from the increased market penetration of the technologies as a result of the R&D support. It is therefore important that when aggregating impacts it is clear that the estimates are on a consistent timeframe.
- Not all impacts are certain. Taking the example described above for support for the demonstration of FOAK technologies, we can be relatively certain about the expenditure on these projects, but we can be less certain about the impacts that will arise from them. A certain proportion of FOAK technologies will not make it to full market penetration, so the estimates need to allow for this. This is also an issue for the adaption projects supported under the LIFE programme, which focus on “innovative practices and measures”, so there is some uncertainty over the impacts from replication.
- The impacts are measured relative to a baseline. Unlike expenditure, and mobilised finance, which are accounted for as absolute values, the impacts of investment are typically reflected as relative metrics i.e. relative to a baseline. This means the quantification of the impacts requires some definition of what would have happened in the absence of the intervention. This is an additional piece of information which increases complexity, but also the potential for inconsistency between methods. To address this issue it is important to use indicators which can have a clear baseline and established emission factors, such as GHG emissions savings and energy intensity for climate mitigation actions.

[284] Taking the LIFE programme as an example the climate action projects are very diverse and range from GHG emission savings in heavy industry, innovative actions by SMEs, through to projects relating to land use / agriculture etc. Therefore the methodologies that are used to quantify the impacts are rather diverse. Furthermore, some projects have high absolute GHG savings, others demonstrate innovative technologies with small savings in the short terms but the potential to have much greater impacts if rolled out in the sector. (Pers. Comm., DG CLIMA)

As shown in the table below, for several budget programmes and FIs specific guidelines and tools have been developed in order to facilitate the consistent and comparable assessment of the climate-relevant results. Notable examples include the *"CO2 model for operational programme assessment"* which has been developed to aid the consistent assessment of CO_2 savings from operational programmes supported through ERDF and CF. This tool includes default data sets, as well as harmonised calculation assumptions, to simply the calculation approach. It has also been developed taking into account the type/format of data that is typically available on the ERDF/CF projects i.e. expenditure data. For FIs, the guidance developed by the EIB *"Methodologies for the assessment of project GHG emissions and emission variations"* includes a lot of detail on the specific approaches that need to be followed in the GHG assessment of individual projects. It includes a description of the calculation approach, as well as emission factors for specific fuels and grid emission factors for different countries. In this way, the EIB approach provides a lot of the information required to inform an assessment of the GHG impacts, without going so far as providing a standardised tool.

For other budget programmes guidelines are less detailed on the calculation approaches. For example, the LIFE guidance provides signposting to other tools and guidance for reporting rather than specifying values for data parameters itself. However, this in part reflects the diverse range of projects supported under the programme, which include capacity building projects where the climate-relevant results may be less certain. A similar issue is faced by the projects supported under Horizon 2020, which supports research projects. For this programme, the "*Guidelines on the calculation of Common Performance Indicators for projects supported under the Intelligent Energy Europe programme"* (which was later integrated into H2020) attempt to provide some further guidance to project beneficiaries with respect to indicator development and reporting.

In the case of EAFRD and EAGF the guidelines refer to methodologies for the quantification of emissions from agriculture in general, and do not attempt to describe approaches to assess the individual actions taken under the programmes. However, the guidelines do encourage "Member States to improve GHG inventories towards higher tiers, which would allow demonstrating the effects of technological improvements". This reflects the additional complexity associated with the assessment of GHG savings in this sector. At the same time, this does result in a calculation methodology which differs to the bottom up calculation methodologies used by other budget programmes, and therefore limited the comparability of the results. A further potential weakness of this approach is that it may lead to perverse results, for example if changes in emissions are strongly driven by external factors that are unrelated to the programme's activities.

One potential gap is that most of the identified guidelines focus on assessment of climate mitigation results i.e. reductions in GHG emission, with much less coverage of the impacts on climate adaptation. This is consistent with the analysis of the indicators themselves, where the climate adaptation indicators were mostly used to reflect outputs rather than results.

Table 3-6 Overview of available guidelines and tools for calculating and reporting climate results

Programme/FI	Accompanying guidance or tools	Main elements of the guidance or tools
Budget programmes		
ERDF and CF	A tool for the calculation of the CO_2 impacts of investments has been developed "CO2 model for operational programme assessment" (CO2MPARE)[285]	The main principle of the model is to estimate the carbon emissions related to various investments by assessing the emission impact per euro spent for a given type of activity and multiplying this by the amount spent on the activity. The model thus connects two types of data: • Financial data that describes the amounts invested in various activities. • Physical data that describes the emission impact of given activities. The model converts financial resources allocated to an activity (e.g. road construction), into physical quantities (e.g. km of road constructed), which then lead to changes in CO_2 emissions. The model takes into account all CO_2 emissions that are linked to the construction phase and operation phase of the evaluated investments. For each phase a differentiation is made between 'direct' and 'indirect' emissions. The model includes certain default parameters for key elements of the calculation of the CO_2 emissions e.g. CO_2 emission per km of road constructed. It also included certain baseline assumptions which are used to derive the net change in emissions e.g. the default source of electricity generation.
ESF	No climate related indicators are applied, so guidance is not required	n/a
EMFF	No guidelines or tools identified	n/a
EAFRD EAGF	Detailed guidance to support managing authorities with the implementation of the above regulations was developed by the Commission and is accompanied by a shorter handout version (2015).	The guidance describes the use of an indicator "GHG emission from agriculture" which reflects the change is emission at an aggregate level in the sector. The indicator therefore has limited causality with actions taken as a result of the budget programme. Instead, the indicator reflects the net GHG emissions from agriculture, as reported by Member States in their national greenhouse gas emissions. It therefore covers all emissions sources,

[285] http://ec.europa.eu/regional_policy/en/information/publications/guides/2013/co2mpare-co2-model-for-operational-programme-assessment-in-eu-regions-improved-carbon-management-with-eu-regional-policy

Programme/FI	Accompanying guidance or tools	Main elements of the guidance or tools
		and does not attempt to isolate specific changes in emissions associated with actions taken in response to the programmes. Reference is made to the different tiered methodologies which can be used to develop the emissions inventories where "when using lower tiers, GHG emission estimates do not capture the effects of all mitigation measures that are supported by the CAP", and therefore "GHG emission estimates, in particular in the 'agriculture sector' (non-CO2 gases) may not reflect the impact of all measures put in place and have a high level of uncertainty." It is though recognized that the situation should improve over time as inventories become better developed.
LIFE	General guidance on qualitative and quantitative outcome indicators for LIFE projects	Guidance is provided on the calculation of the impacts of projects of GHG impacts, amongst other indicators. The guidance is brief, but requires that the beneficiary to provide values for the baseline scenario at the beginning of the project and to report emissions avoided as a result of the project activities at the end. In relation to calculation methodologies, the guidelines do not specify an approach but instead makes reference to "reliable sources" for methods. These sources include references for carbon footprint calculators and emission factors. For climate change adaptation projects the guidance includes definitions for vulnerability, and links to sources on climate vulnerability in Europe, for use in the assessment of particularly vulnerable areas. Definitions are also provided for grey and green infrastructure, for the purposes of assessing infrastructure targeted for climate resilience. No specific methodologies are specified for quantifying the impacts.
Horizon 2020	Guidelines on the calculation of Common Performance Indicators for projects supported under the Intelligent Energy Europe programme (which was later integrated into H2020) include indicators relating to reduction of greenhouse gases.	The guidelines firstly describe definitions for the different indicators, and then methodologies (either bottom up or top down) for the estimation of the impacts. Guidance is provided on the selection of the baseline, and the calculation of short-term and long-term impacts. Some simple checks are included in the guidance to help ensure the robustness of the estimates. A series of references are included for data on conversion factors, emission factors and baseline efficiencies, such

Programme/FI	Accompanying guidance or tools	Main elements of the guidance or tools
		as the efficiency of an average house or car. Links are also provided to other guidance documents with further details on calculation methodologies.
CEF	No guidelines or tools identified	n/a
Copernicus	No guidelines or tools identified	n/a
DCI/ENI/IPA II	The EU International Cooperation and Development Results Framework provide a tool to measure results achieved against strategic development objectives Contributions made via FIs managed by the EIB fall under the EIB Results Measurement (ReM) Framework (see below)	EU RF is designed as a tool that provides a snapshot of key results at a corporate level, linked to interventions financed by the EU, and is complementary to results reporting at the level of individual project and programmes. Consequently, the framework is focussed on macro-level output indicators e.g. Number of countries/regions with climate change strategies (a) developed and/or (b) implemented with EU support. Guidance is included on the development of baselines and targets, and also on the relative contribution approach (i.e. whether to reports based on just the EU contribution to the total funding, or the results for all funding sources).
Financial Instruments		
FIs under management by the EIB	The EIB has developed guidance on Methodologies for the Assessment of Project GHG Emissions and Emission Variations[286]	The methodologies allow for the estimation of two measures of GHGs from projects financed by the Bank: • the absolute GHG emissions of the project, and; • the variation in emissions compared to a baseline, referred to as the relative emissions, which can be either positive or negative. Not all projects need to be included in the GHG footprint and only projects with significant emissions are to be assessed. These are: • Absolute emissions greater than 100,000 tCO_2-e • Relative emissions (either positive or negative) greater than 20,000 tCO_2-e The guidance describes the typical types of projects that will exceed the thresholds and those that typically won't. Also, examples are provided of the types of activities that are associated with GHG emission.

[286] http://www.eib.org/attachments/strategies/eib_project_carbon_footprint_methodologies_en.pdf

Programme/FI	Accompanying guidance or tools	Main elements of the guidance or tools
		Definitions are also provided of project boundaries, including direct and indirect emissions. Metrics are also defined, including sources for emission factors. A description is provided of the calculation approach, based on the absolute emission estimate, the baseline emissions estimate and the relative emissions change. The information required for the calculation of emissions from different sources, along with the calculation method (formula and emission factor) are specified in an annex. Emission factors for specific fuels are specific, along with grid emission factors for different countries.

3.3.1 Methodologies used to assess climate relevant results elsewhere

Alongside the review of methodologies used by budget programmes and FIs within the EU's MFF, we have also provided a high level review of the methodologies used elsewhere. This includes methodologies used by national governments, as well as by international financial institutions.

The findings from this review suggest the methodologies that have been developed and adopted for the EU budget programmes and FIs are comparable to those used elsewhere. For example, the guidelines that have been prepared by the EIB for the calculation of GHG emissions are comparable to those used by other International Financial Institutions for assessing the net impacts of investments. Likewise, the indicators that are used to assess outputs and results are comparable with those used by other international funds, such as the International Climate Fund. Also, private investors are starting to integrate GHG footprinting and portfolio carbon intensity assessments in their asset management[287] as part of broader approach to climate related disclosure.

In the case of the Global Environmental Facility (GEF) separate guidelines have been developed for assessing the GHG impacts of projects in different sectors. This recognizes that the methodologies that would be applicable to, for example, land-use measures, would be different in nature to those associated with the building sector. This recognition of the need for different guidelines for different sectors was reflected in some of the methodologies used for EU budget programmes but not explicitly for all.

Finally, the approach that is used by the Scottish Government to assess the impact of government spending on GHG emissions is worth further mentioning. This approach uses a different analytical approach to most other methodologies, by using an environmentally extended Input-Output methodology. This calculation uses economic data on the flow of goods and services in the economy and couples this with information on the GHG emissions from these sectors. It can therefore calculate the emissions from different areas of expenditure (but is less able to assess GHG savings from mitigation actions). It therefore doesn't aim to assess the causality between specific actions taken as a result of the budget expenditure and the associated emissions, but does show the net emissions from the different areas of budget expenditure. It therefore has some parallels with the approach used in the CO2MPARE tool.

The review suggests that while there are lessons that can be learned from the approaches used to assess climate relevant results elsewhere, these are largely associated with detailed issues of how the quantify impacts rather that fundamental differences in approaches. It is therefore valuable for the EU institutions to continue to work with other international bodies to harmonise methodologies, and

[287] See eg https://www.nn-group.com/nn-group/file?uuid=9fd9114c-aa84-408c-821c-aac24aaabe00&owner=8258d08b-0e63-4493-8cb4-6ae2ce7187e3

share experiences. This is already happening in a number of areas, for example, as part of the EIBs participation in the work of the International Financial Institutions Technical Working Group.

The approach used by the Scottish Government provides an interesting example of a methodology which can be used to assess the GHG impact of the whole budget, so is able to cover all areas of expenditure with a single approach. This could be an approach considered by the EU. However, this approach is not suited to the assessment of specific climate mitigation actions, so it would need to be complemented by a more bottom up approach assessing the impacts of those specific actions with large net impacts – as is the case with the Scottish Government methodology.

A study for DG REGIO[288] identified a number of example of good practices in monitoring reductions of GHG emissions in the 2013 Annual Implementation Reports under ERDF/CF. The common elements of these good practice examples include clear descriptions of the emissions calculations, information on the emission factors used, verification of data sources.

3.4 Reporting requirements and processes for climate-relevant indicators

The final aspects of the tracking framework for climate-relevant results that has been explored is the specific reporting requirements and processes. As part of the review we have considered both the initial ex-ante reporting of climate-relevant results that formed part of the impact assessment process, and the on-going reporting of performance indicators by the budget programmes and FIs.

For this part of the review we only looked at climate change mitigation impacts, as this analysis was carried out in parallel with the simulation of the GHG profile of the MFF (see section 4).

3.4.1 Ex ante estimates of climate-related results reported in Impact Assessments

The first point at which the climate-related results of a budget programme or FI might be calculated and reported is as part of the impact assessment (IA) process. As part of this process, there is a requirement for the environmental impacts (including those climate related) of a programme to be screened and where these impacts are significant, for the impacts to be quantified.

The table below summarises the estimates that were made and reported as part of the IAs for the respective budget programmes.

Table 3-7 Ex ante results data for climate mitigation related expenditure, by budget programme

Programme	IA reference	
ERDF	SEC(2011)1138	No GHG emission savings quantified – impact on climate mitigation is included in the economic assessment (assessing jobs created and value of energy savings associated with allocated EU investment).
CF	SEC(2011)1138	
ESF		No GHG emission savings quantified – indicator not relevant to climate actions supported by programme.
EMFF	SEC(2011)1416	No GHG emission reductions quantified – impact on climate mitigation not included in the environmental assessment.

[288] Ex post evaluation of Cohesion Policy programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and Cohesion Fund (CF) – Work Package Zero: Data collection and quality assessment

Programme	IA reference	
EAFRD	SEC(2011)1153	GHG emission savings developed using the PICCMAT database and CAPRI model (and the JRC evaluation of the livestock sector's contribution to the EU GHG emissions, GGELS, which uses the CAPRI model). At the time of the IA, projections available up to 2020.
EAGF		
LIFE	SEC(2011)1542	Reductions in CO_2 emissions (tonnes/ year) based on estimated impacts derived from previous projects funded (2007-2009), supported by qualitative assessment.
Horizon 2020	SEC(2011)1427	No GHG emission savings quantified
CEF	SEC(2011)1262	GHG emission reductions estimated using modelled data, as follows: • For CEF-transport, the impact on CO_2 emissions is estimated qualitatively in in relation to the EU Reference Scenario. The IA indicates that emissions reductions will arise from the modal shift, induced by the development of infrastructure, to alternative modes of transport. • For CEF-Energy, the impact on CO_2 emissions are estimated qualitatively relative to the EU Reference Scenario. The IA indicates that emissions reductions will arise since the construction of electricity lines would enable the large scale deployment of renewable energy. At the time of the IA, projections available up to 2030.
Copernicus	SWD(2013)190	No GHG emission reductions quantified – indicator not relevant to climate actions supported by programme.
DCI	SEC(2011)1469	No GHG emission reductions quantified – climate mitigation

Programme	IA reference	
		impact reported in qualitative terms, assessing the coherence with international obligations.
ENI	SEC(2011)1466	No GHG emission reductions quantified – climate mitigation impact reported in qualitative terms, identifying existing one-off examples of projects which have led to energy savings or reduced emissions.
IPA II	SEC(2011)1462	No GHG emission reductions quantified – climate mitigation impact reported in qualitative terms as part of environmental concerns.

For most of the budget programmes, the IAs did not include an estimate of the potential impacts on GHG emissions. Exceptions were the IAs for EAFRD/EAGF, CEF, and LIFE. For LIFE the estimates were based on bottom up estimates that drew upon previous project data; for the others the estimates were based on a top down assessment using EU wide model results.

For DCI, ENI and IPA II the expected impacts on GHG emissions were maximized in qualitative terms as part of the IAs. However, for ERDF, CF, ESF and EMFF these impacts were not maximized explicitly in the IAs.

This analysis indicates a potential a weakness in the current approach. The IA process provides the first opportunity to identify the potentially negative climate impacts of expenditure (and therefore the opportunity to put in place mitigation actions) as well as the positive climate impacts (and therefore the opportunity to put in place actions to maximize these impacts). It also helps to ensure that the consideration of these impacts is included in the design of programmes[289].

3.4.2 On-going reporting of climate-relevant results

For those budget programmes with climate-relevant results indicators, data on actual expenditure is required to be reported regularly. A brief summary of the reporting requirements is provided in the table below. This also includes a summary of the approach to aggregating the data.

Where indicators data has been reported, this is further analysed in Section 4.

Table 3-8 Identification of datasets to include in the simulation of the GHG profile of the MFF

Programme	Requirements for reporting	Indicator data
ERDF	Results required to be reported after the first Annual Implementation Report (AIR) due 31 May 2016, and every year thereafter	AIRs submitted to the Commission by Member States are summarised and published by the Commission. Raw data is also available through the ESI Funds Open Data Platform
CF	Results required to be reported after the first AIR - due 31 May 2016, and every year thereafter	AIRs submitted to the Commission by Member States are summarised and published by the Commission. Raw data is also available through the ESI

[289] It is though worth noting that there is no evidence that a lack of quantification as part of the impact assessment led to a weakening of the consideration in the final budget programme.

Programme	Requirements for reporting	Indicator data
		Funds Open Data Platform
ESF	*No relevant climate relevant results indicators*	*No relevant climate relevant results indicators*
EMFF	*No relevant climate relevant results indicators.* *Most relevant result indicator: Change of fuel efficiency in fish capture (see appendix 2 below)*	*No relevant climate relevant results indicators*
EAFRD EAGF	Starting in June 2016, and each year until 2024, Member States are required to submit to the Commission an AIR. The AIR provides information about the implementation of the rural development programme (RDP), as well as the evaluation plan. The AIR submitted in 2017 (hereinafter: AIR 2017) shall also include the quantification of programme achievements, in particular through the assessment of the result indicators (including complementary result indicators), and further provide answers to relevant evaluation questions.	For EAFRD, AIRs submitted to the Commission by Member States are summarised and published by the Commission. Raw data is also available through the ESI Funds Open Data Platform.
LIFE	Regular reporting by project beneficiaries Mid-term evaluation in 2017	All monitoring and reporting of LIFE indicators is captured by an electronic database with private access for the Commission
Horizon 2020	Regular reporting by project beneficiaries	CORDA database and project documents capture information on common Performance Indicators
CEF	Mid-term evaluation in 2017 in addition to regular reporting by project beneficiaries	*No relevant climate relevant results indicators*
Copernicus	Mid-term evaluation in 2017	*No climate relevant indicators reported*
DCI	With the issuance of the Sixth Assessment Report produced by UNEP (scheduled for mid-2016)	
ENI	*No relevant results indicators*	
IPA II	*No relevant results indicators*	

3.5 Key conclusions from the review

Following the review of the current indicators, methodologies and guidelines used in the tracking of climate-relevant results associated with selected budget programmes and FIs of the MFF, the following headline conclusions can be drawn:

- A results framework (Budget Focussed on Results) has been established at EU level to better establish links between EU expenditure and results. Within this framework, milestones and targets have been set – and are accompanied by common indicators to measure progress against them.
- For the majority of the budget programmes that were reviewed as part of the study, common frameworks were identified for the development and monitoring of climate related indicators. These are set as part of Union legislation so have a strong legal basis.
- There are though some potential gaps in the current framework. For example, both ESF and Copernicus have specific climate related objectives, but do not appear to have defined specific climate related indicators, despite targeting climate in their objectives. Likewise, the framework for FIs appears to be less comprehensives, with no climate relate indicators identified for a number of the instruments that were examined.
- The common frameworks tend to focus on output indicators. Outputs are relatively easy to define, monitor and report, and can be tailored to the specific characteristics of the budget programmes. This has led to a large number of indicators, and only limited harmonisation across different budget programmes. Moreover, these output indicators only provide a partial picture of the actual results from the climate-relevant indicators.
- In contrast, 'results' and/or 'impact' indicators provide a more complete assessment of how EU expenditure on the budget programmes has contributed towards the EU's climate objectives. In relation to mitigation impacts, there has been a general harmonisation around the use of GHG savings as the key results indicator. No results indicators were identified for any budget programmes in relation to climate change adaption action – although there are some output indicators relating to climate resilience.
- The review identified some potential inconsistencies in definitions of the different types of indicators, between programmes. For example, where EAFRD and EAGF refer to impact indicators as 'reflecting the areas where the CAP is expected to have an influence' and CF and ERDF refer to impact as 'the change that can credibly be attributed to an intervention'.
- The results framework is established at budget programme level. However, implementation of indicators, and the monitoring and modelling of results, varies by programme, e.g. it may be at the level of the operational programme, multi-annual work programme, or at project level. To help ensure consistency in the development of indicators, some budget programme have developed guidelines to support Member States or project beneficiaries.
- Additional guidance has also been developed by budget programmes to support the consistent calculation and reporting of indicators, particularly where this involves quantitative information. Across the different budget programmes the methodological approaches to model results generally follow the same principle across guidance documents, e.g. establish a baseline; measure/ model the result of the activity; subtract the latter from the former to determine the impact. This consistency helps to make the results indicators more comparable. However, there are some variations in the methodologies, including the data sources that are recommended for use, and the quantification approaches themselves. These differences make the results less consistent, and reduces comparability.
- The metrics required to adequately apply this method can only be determined according to the activity data; thus, even at project level, impacts are monitored and modelled at component level and then scaled up to project level. For reporting purposes these are then aggregated further to funding programme level which means that some of the detail outlining the metrics used is lost and therefore some of the transparency of reporting is compromised.
- The inconsistencies and gaps identified above make it very difficult to meaningfully compare the results of climate-related expenditure. Some comparisons are possible for those budget programmes that report similar indicators. However, any comparisons should be treated with caution given the different definitions and approaches. Moreover, as a result of the gaps in the

framework, the estimates will represent an underestimate of the total GHG savings from mitigation actions.

3.5.1 Uncertainties and caveats

The results presented above are focussed on the direct influence of the budget programmes on either GHG emissions, or on climate adaptation and resilience. However, this approach may not adequately capture any unintended results from EU expenditure. For the most part, existing monitoring and reporting frameworks developed for the EU budget programmes are not designed to capture secondary effects. This is owing to their inherently unpredictable nature which makes it difficult to identify relevant indicators (see the example below provided in relation to the CEF).

One option explored here is the use of the principles developed by the GHG Protocol. The GHG Protocol is an international accounting approach which can be used by organisations to quantify and manage their GHG emissions. It is designed to capture direct and indirect GHG emissions (whereby Scope 1 relates to direct GHG emissions; Scope 2 relates to indirect GHG emissions); and Scope 3 covers all other indirect emissions that occur in a company's value chain)[290]. These principles could in theory be applied to the reporting of GHG in relation to EU expenditure to capture the unintended GHG emissions, where relevant. However, these principles are designed to be carried out at project level for defined processes. The projects receiving EU funding do not always sit within predetermined processes and the number of projects funded is large. As such, the administrative and financial costs to the Union required to carry out the calculations at EU level would be disproportionate to the overall expenditure under the respective budget programmes[291].

In the case of some EU budget programmes, the monitoring and reporting framework does go some way to capturing the unintended consequences of its expenditure. For example, under EAFRD, expenditure allocated to each measure is then assigned a primary Union Priority, along with secondary ones. However, a review of the RDPs submitted found that in many cases, competent authorities have not provided that level of detail (consequently there is no information ex ante or ex post to justify the allocation) (CCRI et al., 2016)[292]. Moreover, the linking of secondary Union priorities only relates to expenditure by measure rather than the indicators used to track the results of said expenditure.

Box 3: Difficulties encountered to monitor and report unintended effects from EU expenditure – using the CEF as an example

Funding programme: CEF-Transport

Specific objective 1: Removing bottlenecks, enhancing rail interoperability, bridging missing links, and improving cross-border sections

Indicator 1: The number of new or improved cross-border connections

Improved cross-border connections is intended to remove bottlenecks and will therefore improve traffic flow, with expected GHG emission reductions as an unintended consequence. However, another dimension to consider is the increased traffic volume, resulting from the improved traffic flow – where drivers had previously avoided driving owing to heavy traffic.

As well, there are several additional variables needed to understand the climate related secondary effects associated with this indicator, including: fuel consumption of passing traffic (linked to vehicle model/ load/ etc.); time saved from sitting in idle traffic as a result of the improvements; GHG emissions resulting from the building of supporting infrastructure needed to improve the cross-border connection; movement of additional staff needed to meet additional capacity needs; among others.

[290] http://www.ghgprotocol.org/about-ghgp
[291] European Commission, Better Regulation, Tool #3 (Legal basis, subsidiarity and proportionality): http://ec.europa.eu/smart-regulation/guidelines/tool_3_en.htm
[292] CCRI et al. (2016) research for AGRI Committee – Programmes implementing 2015-2020 Rural Development Policy. http://www.europarl.europa.eu/RegData/etudes/STUD/2016/573448/IPOL_STU(2016)573448_EN.pdf

In no cases were indicators identified to monitor and report negative unintended consequences – the justification for this being that each budget programme has mechanisms in place to avoid negative effects, starting first with the impact assessment and running through to the implementation of the budget programme. E.g. to prepare a policy programme under EAFRD, the competent authorities must carry out a SWOT analysis at programme level which will indicate whether there is a threat to climate actions. Where a threat has been identified, competent authorities must develop a strategy to overcome the problems; an ex-ante evaluation is required including a SEA. As such, it is considered that the development and reporting of result indicators to capture unintended negative effects from EU expenditure would again fall short of the principles of proportionality.

4 Simulations of the GHG profile of the MFF

4.1 Introduction

The examination of greenhouse gas emissions and reductions forecast to be achieved through the MMF has been focused on those budget programmes where there is the largest level of climate related expenditure related to mitigation action. Section 4.2 examines in which budget programmes mitigation related climate change expenditure is significant, and also looks at the type of actions funded, as this can be important in identifying how the GHG savings identified with actions can be estimated, if they are not already reported. Understanding the main types of actions which are important can also be important looking forward, in prioritising any future guidance on estimation of GHG reductions.

4.2 Mitigation related expenditure

Table 4-1 shows an estimate of climate expenditure by fund for the period 2014 to 2020. This is based on the MFF mid-term review data, which provided information on climate related expenditure (CRE), supplemented by an analysis to estimate whether CRE is mitigation or adaptation related (see Annex 1 for more details). As discussed in Annex 3, the system of EU climate markers used to track climate related expenditure is imperfect, but it provides an indication of which programmes might be important in delivering greenhouse gas reductions. Similarly, an estimate of CRE funding used for mitigation related activities, while crude as it is done at the programme level and is based mainly on expert judgement, also provides a useful signpost to identifying which programmes might deliver larger GHG reductions.

Table 4-1 shows that overall, about 60 % of climate related expenditure (CRE) might be linked to mitigation related action. Two budget programmes (EAGF and ERDF) are estimated to account for almost 60 % of mitigation related expenditure, with a further four budget programmes (EAFRD, CF, H2020 and CEF) accounting for about a third.

Table 4-1 Estimate of climate and mitigation related expenditure over budget period (2014-2020)[293]

Budget programme	Estimated climate related expenditure (2014-2020) EUR Billion	% of total climate related expenditure	Estimated mitigation related expenditure (2014-2020) EUR Billion	% of total mitigation related expenditure
EAFRD	57	28 %	6	5 %
EAGF	47	23 %	35	30 %
ERDF	37	18 %	33	28 %
CF	18	9 %	16	14 %
H2020	17	8 %	14	12 %
CEF	11	5 %	6	5 %
DCI	5	2 %	2.5	2 %
ENI	2	1 %	1	1 %
IPA II	2	1 %	1	1 %
LIFE	2	1 %	1	1 %
Copernicus	1	1 %	0.5	0 %
ESF	1	1 %	0.5	0 %
EMFF	1	1 %	1.0	1 %
Other	1	0 %	0.5	0 %
Total	**201**	**100 %**	**118**	**100 %**

[Source: based on current EU climate-relevant budget and expert judgment for the disaggregation]

[293] These figures are also presented in Table 2.10 of Annex 1. This also gives assumptions on which the judgement of disaggregation is based.

4.3 Reporting of Greenhouse gas reductions

This section discusses for each of the budget programmes identified above as having significant mitigation relevance CRE, what information exists on greenhouse gas reductions achieved or expected to be achieved by the programme, and how complete this information is likely to be.

4.3.1 ERDF and CF

4.3.1.1 GHG reductions reported

As discussed elsewhere in the report, Member States are required to report a number of 'outcome/results' indicators for various operational programmes implemented, but many of these are not mandatory.

The GHG reductions which Member States expect to achieve in planned programmes are summarised in the thematic objective and budget programme, and total 28 Mt CO_2 per annum (Table 4.2). These are based on detailed data downloaded from the European Commission's open data portal for ESIF. As might be expected, almost all (97 %) of these savings arise from operational programme elements categorised as having the thematic objective of 'supporting the shift towards a low-carbon economy in all sectors'. However estimated reductions from planned programmes in a number of other thematic objectives are also reported.

The Open Data Source platform reports an overall planned aggregate value which is slightly lower than suggested by the detailed data, of 27,336 kt CO_2 eq. By the end of 2015 the projects already selected should deliver 303 kt CO_2 eq and those already achieved, 13 kt CO_2 eq[294].

Table 4-2 Planned annual GHG reductions reported in 'Achievements' data set (kt CO2)

Thematic Objective	ERDF kt CO_2	CF kt CO_2	Total kt CO_2
Low-Carbon Economy	22,384	5,108	27,492
Network Infrastructures in Transport and Energy	330	4	334
Environment Protection & Resource Efficiency	45	320	365
Educational & Vocational Training	19	0	19
Research & Innovation	13	0	13
Social Inclusion	15	0	15
Sustainable & Quality Employment	4	0	4
Total	**22,811**	**5,432**	**28,243**

Source: Derived from 'Achievements' spreadsheet from ESIF open data portal[295].

Estimated GHG savings may however be underestimated, as only about 70 % of the programme elements with the thematic objective 'low carbon economy' (all of which might have been expected to deliver GHG reductions) have reported GHG reductions (Table 4-3). Of those reporting GHG savings, many, but not all also report other specific "output" or "result" indicators as well. These indicators may themselves be directly linked to the GHG reduction estimates, for example, by providing information on the installation of GHG reduction measures. The most relevant of these indicators, i.e. those that could in some way be linked to GHG reductions, are shown in Table 4-4.

Of the Member State operational programmes within the ERDF and CF budget programmes that have not reported annual greenhouse gas reductions, many, but again not all, do report against the indicators listed in Table 4-4.

So, for example, in the case of operational programme elements with a focus on the promotion of the production and distribution of renewable energy, out of a total of 70 operational programme elements, of the 61 that reported GHG reductions, 60 also reported renewable energy (RE) capacity installed, and of the 10 that didn't report GHG emissions, 9 reported RE capacity installed (Table 4-5).

[294] Data from https://cohesiondata.ec.europa.eu/themes/4 (Accessed 31/7/2017).
[295] https://cohesiondata.ec.europa.eu/EU-Level/ESIF-2014-2020-Achievement-Details/aesb-873i. (Accessed 17/5/2017).

Table 4-3 Number of programme elements with thematic objective low carbon economy

	ERDF	CF
Total number	429	24
Number reporting GHG decrease	311	17
% of programme elements reporting GHG decrease	72 %	71 %

Table 4-4 Other indicators reported by programmes also reporting GHG reductions

Indicator	Unit
Renewables: Additional capacity of renewable energy production	MW
Energy efficiency: Decrease of annual primary energy consumption of public buildings*	kWh/year
Energy efficiency: Number of additional energy users connected to smart grids*	Users
Energy efficiency: Number of households with improved energy consumption classification*	Households
Railway: Total length of new railway line	km
Railway: Total length of reconstructed or upgraded railway line	km
Roads: Total length of reconstructed or upgraded roads	km
Urban: Public or commercial buildings built or renovated in urban areas*	Square metres
Urban: Population living in areas with integrated urban development strategies*	Persons
Urban: Rehabilitated housing in urban areas	Housing units

* These common indicators were newly introduced for the period 2014-2020

Table 4-5: Reporting of renewable energy capacity installed for projects with focus on RE

	ERDF	CF	Total
Total number of operational programme elements	64	6	70
of which			
Report GHG reductions and RE capacity	54	6	60
Report GHG reductions but not RE capacity	1	0	1
No reporting of GHG reductions but RE capacity reported	8	0	8
Report neither GHG reductions or RE capacity	1	0	1

4.3.1.2 Attribution of GHG reductions to EU funding

Finally, consideration should be given as to whether all of the emissions which are reported should be ascribed to EU co-financing, as in all cases there is also a national funding contribution (Table 4.6). If only the contribution of EU co-financing to the total funding of programmes was used to estimate the proportion of emissions which could be attributed to EU funding, then the GHG reductions reported in Table 4.2 would be reduced by about 30 %.

However on the other hand, it can be argued that some investments would not have taken place or would not have included climate relevant elements if there was no EU co-financing. This may particularly be the case for infrastructure investments. In these cases it might be more appropriate to ascribe all of the GHG reductions to EU co-financing.

Table 4-6 Average levels of EU co-financing by fund and thematic objective

	ERDF	CF
Low-Carbon Economy	68 %	82 %
Network Infrastructures in Transport and Energy	80 %	84 %

	ERDF	CF
Environment Protection & Resource Efficiency	73 %	85 %
Competitiveness of SMEs	68 %	
Educational & Vocational Training	77 %	
Research & Innovation	67 %	
Social Inclusion	76 %	
Sustainable & Quality Employment	80 %	

Note: values in table are weighted averages across the thematic objective, calculated from the total funding and total EU share of funding. Some priority axes in the Operational Programmes are multi-thematic objectives, and the co-financing rates can vary for interventions within one priority axis.

4.3.2 Horizon 2020

As discussed elsewhere in the report, assessing the GHG reductions achieved by Horizon 2020, the Framework programme for Research and Innovation is difficult. Climate change and sustainable development is a cross cutting objective within the programme, but is monitored using an indicator of climate related expenditure. There are several methodological challenges to developing a GHG reduction indicator which would be used across the whole of Horizon 2020, as projects range from those seeking to target behavioural change, where large numbers of actors may be involved, to projects supporting demonstration of first of a kind. In the case of the latter, there will be a short term impact from the projects that are supported directly, but also long term impacts from the increased market penetration of the technologies as a result of the R&D support, should they prove successful.

While no overall data set is available on GHG reductions from Horizon 2020 projects, an evaluation of the first results from energy efficiency and system integration projects falling under the remit of DG ENER, has been analysed[296]. This collated Key Performance Indicators for the projects where available and assessed their reliability; KPIs are not mandatory and most projects did not report long term KPIs, and many did not report short term KPIs. Out of a total of 161 projects analyses (with EU funding of 663 M€), only 23 (14 %) reported short term GHG reductions (within the life of the project) and only 8 (5 %) longer term reductions (by 2020). Short term GHG reductions from these projects were estimated as 11.6 Mt CO_2/year and longer term savings as 94.2 Mt CO_2/year. The study notes however that the KPIs that were provided were not checked and they include some high values that may have been reduced as a result of negotiation. For example, one project accounted for 9 Mt CO_2/yr out of the total short term GHG savings of 11.6 Mt CO_2/yr. If other projects not reporting reliable estimates of GHG reductions, achieved the same level of greenhouse gas savings per unit of expenditure (of 143 kt CO_2 per year per million euro, then in total the energy efficiency and system integrations related projects could lead to short term GHG reductions of 81.2 Mt CO_2/yr. While all of the energy related projects account for only 5 % of the estimated mitigation related expenditure for the H2020 budget programme, it is not likely to be appropriate to use the same factor to estimate GHG reductions achieved from other projects as they may vary substantially in nature from these energy related projects.

As discussed earlier, if reductions ascribed to EU funding are related to the proportion of EU funding received, then the reductions identified above would be reduced by two-thirds, as the average EU co-financing rate for these projects was 33 %. Again as discussed earlier, it could be argued that such projects would not have taken place at all without EU funding so it may not be appropriate to only ascribe reductions in proportion to the co-financing rate

4.3.3 CEF

The CEF (Connecting Europe Facility) is aimed at supporting projects of common interest for trans-European transport and energy networks. Climate is a cross-cutting objective which is included among the list of "general orientations to be taken into account when setting the award criteria" for operational programmes. The Impact Assessment for CEF[297] noted that on the energy side, construction of electricity lines would enable the large scale deployment of renewable energy, and quoted modelling results from PRIMES to suggest that emissions would be higher if not all necessary infrastructure to utilise renewables was in place. Similarly, the Impact Assessment suggested that a lack of gas

[296] Ricardo Energy & Environment. 'Report on the first results of H2020 projects on energy efficiency and system integration'. Report for DG Energy. Available at https://ec.europa.eu/energy/sites/ener/files/documents/ed62228_h2020_energy_evaluation_final_report_v1.5_3_0.pdf
[297] SEC(2011) 1262 final/ Impact Assessment accompanying the Regulation establishing the Connecting Europe Facility

infrastructure could lead to the use of more carbon intensive fuels. As discussed in Annex 1, investments in gas and electricity infrastructure are likely to be necessary to ensure coherence with EU climate policy.

In the field of transport, the impact of the development of new infrastructure on emissions and climate change was viewed as depending on the modal shift induced by the development of infrastructure to alternative modes of transport, and by the rebound effect (the increase in traffic induced by the creation of new infrastructure), especially for road transport. In summary, while the impact assessment suggests that the overall impact of the CEF would be to reduce GHG emissions, it provides no quantitative estimate of the reductions which might be achieved. Likewise, no information on projected GHG reductions from specific programmes under the fund could be found.

Estimating the impacts of introducing new infrastructure is complex, as there are often many secondary effects to be taken into account. However, given the relatively large amount of money which is designated as climate related in this fund, then looking forward, some consideration should be given to developing methodologies to estimate associated GHG reductions.

4.3.4 EAFRD

Within the EAFRD, details of programme funding suggest that programme elements with a thematic objective of 'Supporting the shift towards a low-carbon economy in all sectors' will receive €5.2M[298]. This is about 10 % lower than the top down estimate of mitigation related expenditure made in Table 4.1of €5.7M.

Five indicators are used for programme elements with the low carbon economy thematic objective (Table 4.7). Two are for total investment in energy efficiency in agriculture, and investment in renewable energy production, and are expressed in Euro. The other three are concerned with management of land or livestock to reduce GHG and/or ammonia emissions.

The two investment indicators could be used as the starting point for estimating GHG reductions, but would require a number of assumptions, e.g. for renewable energy capacity per EUR of investment, energy production per MW installed, and carbon savings per unit of energy produced. The first of these two parameters will vary depending on technology deployed and the third will vary by Member State. While Member States with full details of the programmes may be able to estimate these with some degree of accuracy, estimating these at the EU level, would require using a typical figure for a representative type of installation, meaning that the estimate is unlikely to be robust, although it would be possible to perhaps generate an upper and lower bound for the assumptions to give an indication of the uncertainty in the estimate. The carbon intensity of energy saved in each Member State could be estimated fairly accurately centrally. Similar considerations would apply to estimating the GHG reductions achieved by investment in energy efficiency, in that investment would need to be turned into annual energy savings achieved, and then into carbon savings.

Deriving GHG reductions from the two indicators regarding land management and management of livestock would not be possible with any degree of accuracy. Firstly, it is not specified whether ammonia or GHG emissions (or both) have been reduced, so it would be necessary to make an assumption about this, followed by an assumption about the GHG savings per ha or livestock unit which could be achieved.

Table 4-7 Indicators for EAFRD programme elements with a focus on low carbon economy

Indicator	Unit	Total reported
Agricultural land under supported management contracts to reduce GHG and/or ammonia emissions	Mha	5.1
Livestock Unit concerned by investments in specific management to reduce GHG and/or ammonia emissions	thousands	922
Percentage of total Livestock Unit concerned by investments in specific management to reduce GHG and/or ammonia emissions	%	2.00 %*
Total investment (private and public) for energy efficiency in agriculture and food processing	EUR million	2,819

[298] https://cohesiondata.ec.europa.eu/dataset/ESIF-2014-2020-FINANCES-PLANNED-DETAILS/e4v6-qrrg Accessed 17/5/2017

Indicator	Unit	Total reported
Total investment (private and public) in renewable energy production	EUR million	2,711

**Weighted average over all programmes reporting, i.e. 922 thousand livestock units is 2 % of total livestock units.*

4.3.5 EAGF

The climate related expenditure for the EAGF, is based on the assumption by DG AGRI that the green direct payments made by Member States constitute climate related expenditure. Farmers receiving these area-based payments have to use practices that benefit the environment and the climate including:

- making soil and ecosystems more resilient by growing a greater variety of crops
- maintaining permanent grassland thus conserving soil carbon and grassland habitats
- protecting water & habitats by dedicating 5 % of arable land to 'ecologically beneficial elements' ('ecological focus areas').

Permanent grasslands are a potential carbon sink, so maintaining their area is important, as their conversion to other uses could lead to carbon emissions. The majority of actions required by green direct payments are, however, more focussed on adaptation and resilience, and within this study, only 10 % of the climate related expenditure identified is assumed to relate to mitigation.

No methodology has been identified for estimating the GHG reductions potentially linked to maintenance of permanent grass land that is currently applied or applicable to the EAGF.

4.3.6 Summary

For the six budget programmes where the majority of mitigation related expenditure is estimated to occur, Table 4.8 gives an overview of the information available on the planned GHG reductions which Member States estimate will occur from the planned programmes they will implement. As discussed above, estimates of GHG reductions for operational programmes or projects in Member States are available for only three of these budget programmes ERDF, CF and Horizon 2020, which together account for almost one half of estimated mitigation related expenditure. For the three other programmes (CEF, EAFRD and EAGF), there is, as discussed earlier, currently no requirement for Member States or COM to report on GHG reductions achieved, although in the case of EAFRD, reporting of some related indicators is required, for programme elements aimed at reducing GHG or ammonia emissions.

The estimated reductions reported in Table 4.8 are uncertain, and almost certainly do not capture the total effect of the budgetary programmes on GHG emissions. However they represent the best estimates available at present. For the ERDF and CF budget programmes, reporting of GHG reductions is concentrated on those programme elements meeting the thematic objective of a low carbon economy. Under this thematic objective, which is estimated to account for about 80 % of total mitigation related expenditure for these budget programmes, operational programme elements are most likely to be focused on actions where the primary objective is to reduce energy consumption, thus delivering GHG savings, or support low carbon forms of energy. Other mitigation related expenditure within the programme is likely to be from actions (typically given a 40 % Rio Marker) where the focus is elsewhere, e.g. improved transport infrastructure or improved resource or waste management and GHG reductions are a co-benefit. Estimating GHG reductions from these types of actions will typically be more complex, and there may be a number of secondary effects to assess, before the net GHG reduction achieved can be estimated. It is also possible that spending in areas which are not identified as climate expenditure may lead to either an increase or reduction in GHG emissions, but these potential impacts on emissions are not captured by the reporting systems currently in place.

In the case of H2020, data is available for a subset of projects focussed on energy efficiency and system integration projects, which account for only 5 % of the estimated mitigation related expenditure for the H2020 budget programme. Reliable estimates of GHG savings were only available for a small subset of these projects. Applying the average GHG reduction achieved per unit of expenditure to the remaining energy efficiency and system integration projects increases the estimated reductions by 79 Mt CO_2 per year.

The estimate of total GHG reductions achieved by the three budget programmes for which estimates are available is therefore 122 Mt CO_2 per year by 2020. For these three budget programmes, it is likely that in reality GHG reductions may be larger than this as reductions have not been estimated for all elements in these budget programmes where CRE was identified, and there may be budgetary expenditure which is not identified as CRE which results in GHG reductions. In addition there are a number of budget programmes with CRE which might be expected to result in GHG reductions but for which GHG reductions are not estimated.

There is a need to consider whether all of these total estimated GHG reductions can be attributed to the EU contribution to the budget programme, or whether the reductions should be apportioned between the EU contribution and national funding. If this approach was adopted then the total reductions estimated for the programme would be reduced. However as discussed earlier, it could also be argued that actions, particularly infrastructure investments might not have taken place without EU co-financing.

Table 4.8 Summary of GHG data reported by budget programme

Budget programme	Expenditure (2014-2020) (EUR billion)[a]	Estimated climate related expenditure (2014-2020) (EUR billion)	Estimated mitigation related EU CRE (2014-2020) (EUR Billion)	GHG reductions reported (Mt CO_2 per year)	Scope of reported GHG data
ERDF	197	37	33	22.8	Covers about three-quarters of expenditure on thematic objective 'low carbon economy'. Spending on this thematic objective accounts for about 80 % of total mitigation related CRE for these budget programmes. Small fraction (3 %) of reductions are associated with programme elements with other thematic objectives.
CF	63	18	16	5.4	
H2020	79	17	14	11.6 (short term) 94.2 (by 2020)	Reported for 14 % (short term) and 5 % (long term) of a subset of energy efficiency and system integration projects. All of these projects themselves account for only 5 % of the estimated mitigation related expenditure for the H2020 budget programme, so GHG reductions achieved could be substantially higher.
CEF	22	11	6	Not estimated	No estimates could be found in the literature for the likely GHG reductions achieved from the energy and transport infrastructure projects implemented under this budget programme.
EAFRD	99	57	6	Not estimated	Other related indicators are reported but cannot be used to estimate GHG reductions without making several other assumptions.
EAGF	313	47	35	Not estimated	No methodology has been identified for estimating the GHG reductions potentially linked to maintenance of permanent grass land, which appears to be the main mitigation related action in this budget programme. Even if methodology was established, then it is not clear that data on the areas of permanent grassland the budget programme prevents from being converted is available.
Other	290	14	8		Not examined in detail here. Some of the remaining programmes (e.g. LIFE) do have GHG reductions as an indicator (although consolidated data for the programme was not available) but many do not.
Total	1 063	201	118		

Notes:

(a) *Expenditure for ERDF, CF, EAFRD from Open Data Source Programme 2014-1020 finance datasheet (https://cohesiondata.ec.europa.eu/dataset/ESIF-2014-2020-FINANCES-PLANNED-DETAILS/e4v6-qrrq accessed 17/5/2017). Expenditure for H2020, CEF and EAGF at current prices from http://ec.europa.eu/budget/mff (accessed 1/8/2017) and total expenditure all budget programmes from the EU Budget 2014-2020 as presented in the MFF Mid-Term Review (SWD(2016) 299 final).*

5 Options for improving the tracking of expected climate results/impacts of the different EU funding programmes

Drawing upon the analysis from the previous sections, we have developed potential options for improving the tracking of expected climate results/impacts of the different EU budget programmes and FIs based on the problems identified. We have taken a simplified approach of the steps set out in the European Commission Better Regulation Guideline to provide a framework for identifying and then appraising the options – as follows:

- **Problem definition**: Further consideration of the problems identified in the results analysis to verify the problem, determine its impacts in terms of scope and scale, identify drivers of the problem and establish a no-change scenario.
- **Identification of options**: In response to the problems defined, a range of options are identified for improving in the current approach. These range from major changes (e.g. changes to legislation) to more minor alterations (such as developing a platform for signposting to existing guidance documents). The development of the options has drawn upon the examples of good practice and lessons learned – as identified through the earlier results analysis. In some cases the options proposed are a variation of one of the examples of good practice.
- **Assess the options proposed**: The purpose of this assessment is identify the most viable policy option for improving the tracking of expected climate results and impacts of the different EU funding programmes. The criteria to assess the policy options considers effectiveness (in addressing the problem areas), efficiency, coherence and feasibility (legal, political and technical), and EU added value (in measuring the results of EU actions, and in the need for action at EU level
- **Outline the most viable package**: this final step bring together the individual options into a package of revisions that most effectively and efficiently address the problem areas.

5.1 Problem definition

In the previous section a number of issues were identified which, acting together, led to problems with the **comparability** of climate-related results across different programme areas and financial instruments, limited the **completeness** of information reported on the climate-related results of the EU Budget, and also the **accuracy** of information reported on the climate-related results. The following specific problems areas were identified as part of the review:

- Inconsistencies between budget programmes in terms of the definitions used to categorise indicator types (e.g. output/ outcome/ result/ impact/ context).
- Inconsistencies and gaps in the use of indicators – particularly of result and output indicators where different variations of the same basic indicator have been developed, e.g. using slightly different units.
- Inconsistencies and gaps in the methodological approaches used to develop the same indicators – while similar in principle, the different methodologies can adopt different approaches, e.g. signposting to different sources for emission factors, or lack detail.
- Lack of transparency in the data aggregation processes and limited detail accompanying the indicators results (e.g. baseline year, unit reported, emission factor used, etc.).
- Different legal frameworks established across funding programmes with mandatory reporting for certain indicators and optional reporting for others.

These specific problems can distilled into 3 broad areas relating to the definition and use of indicators, the calculation methodologies, and the reporting approach. The legal nature, for example whether the requirements are mandatory or voluntary, is an overarching issue relevant to all of these areas e.g. whether the specific indicators are specified in relevant regulations.

Each of these broad problems areas are further elaborated in the table below.

Table 5-1 Problem definition

Issue	Problem definition	Drivers	Relevant stakeholders	Business as usual situation
Inconsistencies in indicator definitions, and in the use of specific indicators	Different definitions are used in budget programme legislation so that an output indicator under one programme may be categorised as a results or impact indicator under another. Also different indicators are used to monitor and report the same basic output or result. For example, several indicators for renewables energy may be applied, with impacts expressed in different units. For some budget programmes and FIs, climate related results indicators are missing altogether.	The definitions used in budget programme regulations are developed independently from one another. The interpretation of the available policy tools and frameworks also varies slightly between the responsible services within the Commission. Likewise the frameworks to develop and report indicators are developed by different Commission services to reflect the specific policy objectives and available data for the relevant budget area. There are also technical challenges in assessing some of the climate relevant results, which may to calculation of indicators more difficult that for inputs.	European Commission officials and National competent authorities	Indicators can be compared systematically for a single funding programme but not between funding programmes. Increased potential for misinterpretation of the results from budget programmes and FIs due to inconsistent definitions. Indicators can be compared systematically for a single funding programme but not between funding programmes. Incomplete understanding of the climate-relevant results for the MFF as a whole, due to gaps in coverage.
Inconsistencies and gaps in methodologies to calculate the indicators	Different approaches and tools have been developed to calculate the results indicators. This includes differences in the recommended data sources as well as the calculation approaches themselves. For some budget programmes and FIs the calculation approaches are	Results indicators are more difficult to quantify than input or output indicators, and the calculation approached need to be tailored to the respective activities. Some methodologies have been developed specifically for the	National competent authorities, banking institutions, European Commission officials	Indicators can be compared systematically for some individual budget programmes where consistent methodologies have been applied However, for other programmes, confidence in the consistent reporting of impacts remains low, and for others

Issue	Problem definition	Drivers	Relevant stakeholders	Business as usual situation
	clearly specified, but not for others. For some budget programmes and FIs, climate related results indicators are missing altogether	budget programme in question		results indicators are missing altogether. Incomplete understanding of the climate-relevant results for the MFF as a whole, due to gaps in coverage and inconsistencies in approach.
Inconsistencies and lack of transparency in aggregation and reporting of information	Results data are aggregated at several levels by different bodies and organisations e.g. from project to programme; programme to national; national to EU; and from one EU funding programme to multiple. However, there is limited information available on the approaches that are used to aggregate the data at budget programme level. There are different reporting requirements between budget programmes, with varying degrees of detail required on underlying assumptions that underpin the calculation	Reporting of results data requires large volumes of information to be reported. The larger the scale of reporting, the greater the volume of information that needs to be reported. This creates additional reporting burden, so there is a driver the limit the additional burdens associated with reporting Reporting requirements are set out at high level, requiring the data to have already been manipulated.	National competent authorities and European Commission officials	Higher uncertainty in aggregated results data as underlying assumptions are not reported. Unable to aggregate further (where aggregated results for a funding programme are reported without a clear indication as to how this was carried out). Where different approaches to calculate the results are used by different budget programmes, the lack of information on the underlying assumptions reduces comparability. Results data cannot be used by the public to understand public expenditure

5.2 Identification of improvement options

For each of the broad problem areas described above, a number potential improvement options have been identified. It is important to recognise that some of these options are intrinsically linked. For example, the further development of reporting tools is strongly related to the specific indicators that need to be reported.

In the subsequent sections for each of the options we have assessed the relative effectiveness of the options in delivering the objectives and the efficiency (i.e. administrative burden) of doing so. This analysis informs the recommended actions set out in section 5.3 to improve the monitoring of climate-relates results from the EU budget.

Table 5-2 Identification of improvement options

Issue	Options	Description
4. Inconsistencies in indicator definitions, and in the use of specific indicators	d) Full harmonisation of all climate relevant indicators across all budget programme regulations.	This would involve the establishment of consistent definitions across all of the climate-relevant indicators, and the incorporation of these into relevant guidelines at budget programme level. It would also require all programmes to use the same indicators for reporting climate-relevant results, and the updating of these indicators in the relevant legislation.
	e) Harmonisation of some climate relevant indicators across all budget programme regulations i.e. not aiming to harmonise across all indicators.	This would involve the establishment of consistent definitions, for a selection of headline climate-relevant indicators, and the incorporation of these into relevant guidelines at budget programme level. It would also involve the harmonisation of the use of these headline indicators, but would still allow some flexibility for programmes to report alternative indicators, or to not reported certain indicators. The harmonisation would apply to all budget programmes and FIs.
	f) Harmonisation of some climate relevant indicators across some budget programme regulations i.e. not aiming to harmonise fully across all programmes	This would involve the establishment of consistent definitions, for a selection of headline climate-relevant indicators, for a selection of budget programmes (e.g. those supporting similar activities), and the incorporation of these into relevant guidelines at budget programme level. It would also involve the harmonisation of the use of the headline indicators, but would still allow some flexibility for programmes to report alternative indicators, or to not reported certain indicators. The harmonisation would apply to selected budget programmes e.g. those with

Issue	Options	Description
		common activities.
5. Inconsistencies and gaps in methodologies to calculate the indicators	d) Establish common methodologies, based on existing best practice, for mandatory use by all budget programmes.	This would involve the establishment and agreement of common methodologies to be used by all budget programmes and FIs in the calculation of specific climate-relevant indicators.
	e) Establish common methodologies, based on existing best practice, for voluntary use by budget programmes.	This would involve the establishment and agreement of common methodologies for voluntary use by budget programmes and FIs for the calculation of specific climate-relevant indicators
	f) Further development and better signposting of existing guidance which could be used voluntarily by different budget programmes.	This would involve the identification and some further development of relevant best practice methodologies (but not the agreement of common methodologies) for voluntary use by budget programmes and FIs for the calculation of specific climate-relevant indicators
6. Inconsistencies and lack of transparency in aggregation and reporting of results	c) Establish common framework and tools for aggregation and reporting of indicators at budget programme and FI level.	This would involve the development of a common framework for the aggregation and reporting of indicators at budget and FI level, which would be applicable to all areas. This would also include relevant reporting tools.
	d) Establish minimum content for reporting aggregation methods and results data, and harmonisation of existing tools.	This would involve would involve the establishment of minimum requirement for the content of reporting on indicators, including additional information on the approaches that have been used to aggregate the results indicators, alongside the indicators. It would not involve the development of new tools.

5.2.1 Inconsistencies in indicator definitions, and in the use of specific indicators

The options for improvement in relation to this problem area are evaluated in the table below.

Table 5-3 Assessment of improvement options for inconsistencies in indicator definitions, and in the use of specific indicators

Option	Score (1; low – 5; high)					Comment
	Effectiveness	Efficiency	Coherence	Feasibility	EU added value	
No-change	1	4	3	5	3	Effectiveness: Indicators cannot be compared systematically between funding programmes, or aggregated across the whole EU budget. Efficiency: No additional effort at programme level, but greater effort required in order to derive any comparable results at MFF level. Coherence: Some coherence between funding programmes already, but lots of scope for improvement. Feasibility: Maintaining status quo would involve least effort in the short term – likely to have acceptance. No legal implications. EU added value: Greater effort required to derive EU results at MFF level.
Full harmonisation of all indicators across all programmes/FIs	5	2	4	1	3	Effectiveness: Would be most effective in ensuring comparability between budget programmes. Would allow aggregation across whole budget on a consistent basis. Efficiency: Change in indicators and/or use of new indicators will require change in systems, and development of new guidance/procedures. This will be required at budget programme level, and again at Member State level. Some redundant indicators may be removed reducing burden. Coherence: Would strengthen coherence between funding programmes, but would limit flexibility within programmes Feasibility: Unlikely to be accepted given the large amount of administrative burden with full harmonisation. Would have legal implications as respective funding programme regulation would need to be amended. Could establish one piece of regulation which applies to the MFF as a whole. EU added value: Risk of losing meaning of EU results where indicators should be budget programme specific. Would facilitate reporting of EU results at MFF level.

Option	Score (1; low – 5; high) Effectiveness	Efficiency	Coherence	Feasibility	EU added value	Comment
Harmonisation of some indicators across all programmes/FIs	4	3	4	2	4	Effectiveness: Would be partially effective in addressing the inconsistency. Focussing on the most important indicators would still achieve a high level of effectiveness Efficiency: Some effort would be required to realign indicators according to revised categories at budget programme level, and again at Member State implementation level. This would be less than full harmonisation. Some redundant indicators may be removed reducing burden. Coherence: Would strengthen coherence between budget programmes Feasibility: Would still have legal implications as respective funding programme regulation would need to be amended. Could establish one piece of regulation which applies to the MFF as a whole. Implementation would likely be delayed to allow Member States sufficient time to amend existing policies EU added value: Would facilitate reporting of EU results at MFF level. Only relevant indicators would be harmonised.
Harmonisation of some indicators across some programmes/FIs	3	3	3	4	3	Effectiveness: Would be partially effective in addressing the inconsistency. Efficiency: Some effort would be required to realign indicators according to revised categories at budget programme level, and again at Member State implementation level. Some redundant indicators may be removed reducing burden. Coherence: Would strengthen coherence between funding programmes Feasibility: Would still have legal implications as respective budget programme regulation would need to be amended. Could establish one piece of regulation which applies to the MFF as a whole. Implementation would likely be delayed to allow Member States sufficient time to amend existing policies EU added value: Would partially facilitate reporting of EU results at MFF level – risk of some budget programmes and FIs getting side-lined where their results are not be included in EU reporting.

All of the options receive a similar score; there is not clearly preferred option. The most effective option would be to harmonise fully across all budget programmes. However, this would require a lot of effort to realign the indicator frameworks, which would then need to be reflected in the respective programme regulations. This would affect the feasibility of this option. The options to harmonise only for selected indicators, or across selected programmes, would reduce the administrative effort, but would be less effective in addressing the problem. Moreover, the changes would still require changes to the regulations, but not to the same extent. However, the full harmonisation is likely to be too technically challenging, and some partial harmonisation would be most feasible. Therefore, some further harmonisation, but across selected indicators and budget programmes is the recommended option. Indeed some work is already underway, led by DG REGIO, and working with the other ESIF DGs to harmonise concepts and definition of common indicators across the Funds.

5.2.2 Inconsistencies and gaps in methodologies to calculate the indicators

The options for improvement in relation to this problem area are evaluated in the table below.

Table 5-4 Assessment of improvement options for inconsistencies and gaps in methodologies to calculate indicators

Option	Score (1; low – 5; high)					Comment
	Effectiveness	Efficiency	Coherence	Feasibility	EU added value	
No-change	2	1	3	5	4	Effectiveness: Results data is reported by the respective competent authorities for the respective budget programmes. However, indicators cannot be compared systematically, or aggregated at EU budget level. Efficiency: Greater detail required in reporting of results data to ensure that the approach taken is well documented and transparent. Greater resources required to aggregate data to ensure the variabilities in each approach are appropriately translated in a comparable manner. Duplicated effort where multiple methodological approaches are developed which are fundamentally the same Coherence: Limited coherence between funding programmes – level of coherence which can be achieved is dependent of the level of detail supplied Feasibility: Likely to be accepted by competent authorities – unless there is a need strengthen the link between spending and results, e.g. budget allocations are revised according to expected results EU added value: EU methodologies have been developed for certain budget programmes – there could be more EU added value in supporting their application

Option	Score (1; low – 5; high)					Comment
	Effectiveness	Efficiency	Coherence	Feasibility	EU added value	
Mandatory common method	5	1	4	1	3	Effectiveness: Would significantly increase the consistency of results and the ability to aggregate impacts at EU budget level. Would also strengthen quality of results data for certain programmes. Efficiency: Development of methods applicable to all budget programmes and FIs would involve substantial additional work, along with additional effort to implement. May be some streamlining of methods. Coherence: Coherence would be increased, but some limitations as overall nature of programmes are still different – thus where indicator is not relevant to a budget programme, no common method can be developed Feasibility: Low feasibility due to mandatory nature. Would be even more difficult to agree methods than indicators. EU added value: Would facilitate the aggregation of results data at EU level, but may restrict flexibility at programme level
Optional common method	4	2	3	3	4	Effectiveness: Unclear added value – already guidance available outlining methodological approaches Efficiency: Development of methods will still require additional effort, but effort associated with implementation will be less as not all budget programmes will chose to implement. Coherence: Will enable greater coherence, but may not be applicable to all budget programmes. Feasibility: Some technical challenges, but voluntary nature of implementation would make it more feasible EU added value: Low use of existing optional common methods suggests that there wouldn't be much added value for reporting of results data at EU level
Further development and signposting of exiting methods for	3	4	3	4	4	Effectiveness: Less effective than other options as drawing upon current methods. However, some of these are already well developed. Efficiency: Streamline efforts to develop a methodological approach. Bring together in one

Option	Score (1; low – 5; high)					Comment
	Effectiveness	Efficiency	Coherence	Feasibility	EU added value	
voluntary use						place relevant methodologies – help to streamline the selection of which method to use and reduce reporting requirements where Member States can just reference existing method Coherence: Potential to increase coherence between funding programmes if one document signposting methodological approaches is referenced at the level of the MFF Feasibility: Most feasible options EU added value: Would facilitate the sharing of best practices between Member States and encourage some consistency between reporting

Overall the option that score strongest is the further development and signposting of existing methodologies. This draws upon existing established methodologies, so limits the additional effort which would be required for the development of new methods, but would still achieve greater harmonisation. The further promotion of the methods would also spread best practice to those budget programmes and FIs where methodologies don't exist, or can be improved. It also provides a voluntary approach; in general the agreement of mandatory methods would be much more difficult that the agreement of indicators.

5.2.3 Inconsistencies and lack of transparency in aggregation and reporting of results

The options for improvement in relation to this problem area are evaluated in the table below.

Table 5-5 Assessment of improvement options for inconsistencies and lack of transparency in aggregation and reporting of climate related results

Option	Score (1; low – 5; high)					Comment
	Effectiveness	Efficiency	Coherence	Feasibility	EU added value	
No-change	1	4	1	4	1	Effectiveness: Higher uncertainty in aggregated results data. Unable to aggregate further (where aggregated results for a funding programme are reported without a clear indication as to how this was carried out). Large volumes of information may not be fully used. Efficiency: No extra work involved in

Option	Score (1; low – 5; high)					Comment
	Effectiveness	Efficiency	Coherence	Feasibility	EU added value	
						reporting, although extra work required to synthesise reporting at EU budget level. Coherence: Risk of aggregation between funding programmes where results cannot be compared. Lack of detail concerning the reporting requirements reduces coherence between funding programmes Feasibility: Likely to be accepted by competent authorities – unless there is a need strengthen the link between spending and results, e.g. budget allocations are revised according to expected results. EU added value: Existing reporting does not allow the aggregation of results data at EU level
Common framework	5	1	3	3	5	Effectiveness: Would improve transparency and quality of data available across all programmes. Would also enhance understanding of the results data, and the underlying assumptions. Efficiency: Development of common framework would require some additional burden in some areas, but would also reduce burden of processing aggregated results data. Harmonisation of reporting IT systems may be associated with a significant cost. Coherence: Would strengthen coherence between funding programmes, through consistent reporting. Feasibility: May require step change in existing monitoring and reporting approaches EU added value: Would facilitate aggregating data to allow reporting at EU level
Minimum content	4	3	4	2	5	Effectiveness: Improve quality of data and allow easier aggregation of results data. Without a reporting format, minimum content may be open to different interpretations by competent authorities Efficiency: Additional information will be reported and require additional processing, but no fundamental changes to reporting systems. Coherence: Systematic reporting will contribute to greater coherence between

Option	Score (1; low – 5; high)					Comment
	Effectiveness	Efficiency	Coherence	Feasibility	EU added value	
						funding programmes Feasibility: Likely to be some resistance if adopted by regulation particularly where greater resources required as a result EU added value: Would facilitate aggregating data to allow reporting at EU level

The establishment of a common framework and tools and the establishment of minimum content requirements for reporting on methodologies, including aggregation approaches, both achieve similar scores. Both also score better than the do-nothing option. If the establishment of a common framework require the re-development of existing IT tools, then the costs of changing the approach may be prohibitive. However, if improvements can be made within the existing systems then this would be more feasible. A lighter touch option would the establishment of minimum content for the reporting of aggregation methods and results data, which would enhance transparency with more limited additional reporting burden.

5.3 Recommended package of options

Following the review of the individual options, the following options are recommended for further consideration by the Commission.

5.3.1 Harmonisation of headline indicators for climate relevant results

We recommend that the Commission considers the further harmonisation of the climate relevant results indicators across selected budget programmes and FIs. This harmonisation should be focused around a core set of indicators which should be reported consistently for those budget programmes which have significant levels of climate-related expenditure, and for which the calculation of the results indicator is considered sufficiently robust.

Suggested headline indicators are proposed below. The indicators consider the prevalence of the indicators already established by programmes; the anticipated ease against which such indicators could be monitored and reported against; and their relevance to reporting meaningful results which capture the results of climate action (e.g. reporting the number of projects delivering climate actions does not capture the size of the projects and therefore would not capture meaningful results). For example, the headline indicators for adaptation actions are output indicators rather than result indicators owing to the inherent difficulties associated with monitoring and reporting results indicators for such actions.

Table 5-6 Potential headline indicators for the MFF

Type of indicator	Type of climate action	Proposed headline indicator	Related programme(s) with indicator already developed	Related programme(s) but no indicator developed
Result	Mitigation	GHG emissions savings	CEF (energy); ERDF; CF; CAP (EAFRD and EAGF); DCI*; LIFE, H2020**	CEF (transport) ; IPA II ; ENI ; ESF ; EMFF
Result	Mitigation	Energy intensity	ERDF; CF; EAFRD; EMFF	CEF (energy)
Result	Mitigation	Additional capacity of renewable energy production	ERDF; CF; CEF (energy)	EAFRD
Output	Adaptation	Population benefiting from adaptive measures	ERDF; CF	CEF (energy); DCI*; EAFRD; LIFE
Output	Governance	Outreach – measured by population/ number of organisations/ number of holdings under contract/ number of advisors trained/ etc.	LIFE; EAFRD; EAGF	-

Table notes : DCI finances external climate actions. H2020 has GHG emission savings as a CPI for selected projects only

5.3.2 Further development of existing calculation methodologies

The full harmonization of methodologies for the calculation of the climate related indicators from EU budget programmes and FIs is a relevant aspiration, but would be difficult to achieve in practice. This is due to the wide range of different activities that are supported by the programmes, and the difficulties developing robust approaches to calculate the impacts for certain actions (see section 3.3). However, the further harmonization of methodologies, and the building upon existing best practice is recommended.

For programmes that support large infrastructure projects, the guidelines developed by the EIB for the assessment of project GHG emissions could provide a basis for the harmonization of the main methodological steps to be followed (e.g. determine baselines, cut-off rules) but also the datasets and values for key parameters used in calculation e.g. emissions factor. In this way, programmes may be allowed flexibility in the calculation approaches that are applied, but the values for key parameters could be harmonized. These values could be integrated into other existing models and guidelines, such as the CO2MPARE tool developed for the ERDF/CF. The further expansion of this tool to other programme areas could also be explored.

One area where further development of methodologies would be beneficial is with respect to the emissions from the agriculture sectors (EAFRD/EAGF). Given the challenges with the bottom up assessment of measures in this sector, the approaches might apply top down methods, such as decomposition analysis to isolate the policy drivers, from non-policy drivers. These methodologies might be more appropriately applied at EU level, as part of future evaluations of these programmes.

5.3.3 Development of the reporting tools and approach

Existing reporting tools have been developed for the different programmes, and are embedded in the relevant regulations. However, there is no common approach to present the indicators, or information on the underlying methods – including aggregation. We recommend that the Commission explore the further harmonisation of these reporting tools, to enable a more consistent reporting of the indicators at the EU budget level. This is further discussion in Annex 6.

Annex 5 Appendices

Annex 5 Appendix 1 – Europe 2020 indicators

Those indicators underlined in the table are used to monitor progress towards the Europe 2020 Strategy and relevant climate objectives therein.

Table A1-1 Climate relevant indicators in the European Environmental Indicator Metadata Catalogue

Climate relevant indicators in the European Environmental Indicator Metadata Catalogue
Atmospheric emission
Average carbon dioxide emissions per km from new passenger cars (Eurostat_tsdtr450)
CO_2 emissions per inhabitant in the EU and in developing countries (Eurostat_tsdgp410)
Effects of climate change: Air pollution due to ozone and health impacts (EEA_CLIM 006)
Emission intensity of agriculture in Europe (EEA_WREI 001)
Emission intensity of the domestic sector in Europe (EEA_WREI 002)
Emission intensity of manufacturing industries in Europe (EEA_WREI 003)
Emissions of air pollutants from transport (EEA_TERM 003)
Emissions of ammonia (NH3), by source sector (Eurostat_tsdpc290)
Emissions of nitrogen oxides (NOx) by source sector (Eurostat_tsdpc270)
Emissions of nitrogen oxides (NOx) from transport (Eurostat_tsdtr430, Source: EEA)
Emissions of non-methane volatile organic compounds (NMVOC) by source sector (Eurostat_tsdpc280)
Emissions of particulate matter from transport (Eurostat_tsdtr440)
Emissions of sulphur oxides (SOx) by source sector (Eurostat_tsdpc260)
Emissions of the main air pollutants in Europe (EEA_CSI 040/APE 010)
Greenhouse gas emissions (Eurostat_tsdcc100)
Greenhouse gas emissions by sector (Eurostat_tsdcc210)
Greenhouse gas emissions from transport (Eurostat_tsdtr410)
Greenhouse gas emissions from transport (EEA_TERM 002)
Greenhouse gas emissions in non-ETS sectors (Eurostat_t2020_35)
Greenhouse gas emissions intensity of energy consumption (Eurostat_tsdcc220)
Greenhouse gas emissions per capita (Eurostat_t2020_rd300)
Greenhouse gas emissions, base year 1990 (Eurostat_t2020_30)
Heavy metal emissions (EEA_ APE 005)
Pollutants emissions from transport (Eurostat_t2020_rk300)
Progress to greenhouse gas emission targets (EEA_CSI 011/CLIM 051)
Persistent organic pollutant emissions (EEA_APE 006)
Production, sales and emissions of fluorinates greenhouse gases (F-gases) (EEA_CSI 044/CLIM 048)
Specific air pollutant emissions (EEA_TERM 028)

Climate relevant indicators in the European Environmental Indicator Metadata Catalogue
Total greenhouse gas (GHG) emission trends and projections (EEA_CSI 010/CLIM 050)
Climate
Global and European temperature (EEA_CSI 012/CLIM 001)
Heating degree days (EEA_CLIM 047)
Arctic and Baltic Sea ice (EEA_CLIM 010)
Economic losses from climate-related extremes (EEA_CSI 042/CLIM 039)
Extreme temperatures and health (EEA_CLIM 036)
Glaciers (EEA_CLIM 007)
Greenland ice sheet (EEA_CLIM 009)
Hail (EEA_CLIM 053)
Lake and river ice cover (EEA_CLIM 020)
Mean precipitation (EEA_CLIM 002)
Permafrost (EEA_CLIM 011)
Precipitations extremes (EEA_CLIM 004)
Snow cover (EEA_CLIM 008)
Storms (EEA_CLIM 005)
Energy
Use of cleaner and alternative fuels (EEA_CSI 037/TERM 031)
Electricity consumption by households (Eurostat_tsdpc310)
Energy consumption of transport, by mode (Eurostat_tsdtr250)
Energy dependence (Eurostat_tsdcc310)
Final energy consumption (Eurostat_t2020_34)
Final energy consumption by sector (Eurostat_tsdpc320)
Final energy consumption in households (t2020_rk200)
Final energy consumption in households by fuel (t2020_rk210)
Gross inland energy consumption, by fuel type (Eurostat_tsdcc320)
Primary energy consumption (Eurostat_tsdcc120, Eurostat_t2020_33)
Primary energy consumption (Eurostat_tsdcc120, Eurostat_t2020_33)
Final energy consumption by sector and fuel (EEA_CSI 027/ENER 016)
Primary energy consumption by fuel (EEA_CSI 029/ENER 026)
Transport final energy consumption by mode (EEA_TERM 001)
Combined heat and power generation (Eurostat_tsdcc350)
Energy consumption of transport relative to GDP (Eurostat_tsdtr100)

Climate relevant indicators in the European Environmental Indicator Metadata Catalogue
Energy intensity of the economy (Eurostat_tsdec360)
Energy productivity (Eurostat_t2020_rd310)
Energy efficiency and specific CO2 emissions (EEA_TERM 027)
Final energy consumption intensity (EEA_ENER 021)
Progress on energy efficiency in Europe (EEA_ENER 037)
Energy intensity (EEA_CSI 028/ENER 017)
Primary production of energy by resource (Eurostat_ten00076)
Efficiency of conventional thermal electricity generation (EEA_ENER 019)
Overview of the electricity production and use in Europe (EEA_ENER 038)
Overview of the European energy system (EEA_CSI 045/ENER 036)
Electricity generated from renewable sources (Eurostat_tsdcc330)
Share of biofuels in fuel consumption of transport (Eurostat_tsdcc340)
Share of renewable energy in gross final energy consumption (Eurostat_t2020_31)
Renewable electricity (EEA_CSI 031/ENER 030)
Renewable energy in gross inland energy consumption (EEA_CSI 030/ENER 029)
Share of renewable energy in gross final energy consumption (EEA_CSI 048/ENER 028)

Annex 5 Appendix 2 – Climate related indicators by budget programme

Budget programme	Indicators
ERDF CF	Operational programmes are required to identify relevant output indicators from a common list of output indicators set out in the ERDF and CF Regulations (Annex I in both 1301/2013 and 1300/2013); where these are insufficient to reflect the actions of a programme, programme-specific output indicators may also be adopted. Common output indicators - Climate and energy: • Additional capacity of renewable energy production (MW) • Number of households with improved energy consumption classification (households) • Decrease of annual primary energy consumption of public buildings (kWh/year) • Number of additional energy users connected to smart grids (users) • Estimated annual decrease of GHG (tonnes of CO2 eq) • There are also common output indicators reflecting some of the interventions which are allocated a 40 % weighting, including e.g. total length of new railways. Climate-relevant Common output indicators - Environment: • Population benefiting from flood protection measures (persons) • Population benefiting from forest fire protection measures (persons) • Total surface area of rehabilitated land (hectares), • Surface area of habitats supported in order to attain a better conservation status hectares)
ESF	No climate related indicators identified.
EMFF	Member States are required to report on the results of their EMFF projects on an annual basis. The Commission Delegated Regulation (EU) N° 1014/2014 (and the two corrigenda - https://ec.europa.eu/fisheries/cfp/emff_en), as well as the Definitions of Common Indicators report by the FAME Support Unit (http://www.mapama.gob.es/es/pesca/temas/fondos-europeos/fame-version-final-oct-2016-v4_tcm7-437243.pdf) include the final list of common indicators, as follows: • Results indicator UP1.1: Change in the value of production (thousands of Euros) • Results indicator UP1.2: Change in the volume of production (tonnes) • Results indicator UP1.3: Change in net profits (thousand Euros) • Results indicator UP1.5: Change in fuel efficiency of fish capture (in litres of fuel/tonnes landed catch) • Output indicator UP1.7: Energy efficiency and mitigation of climate change No quantitative indicators for measuring the amount of GHG emissions abated or climate adaptation specific indicators are mentioned.
EAFRD EAGF	Common indicators are developed at EU level for outputs, results and impacts. These are defined in the following legislative acts: • Common result and output indicators are provided by Commission Implementing Regulation No. 808/2014. • Indicators of the common monitoring and evaluation framework of the CAP are provided by Commission Implementing Regulation No. 834/2014. **Output indicators:** The Commission defines output indicators in Annex IV to Implementing Regulation 808/2014. These indicators serve to track results for multiple measures. Relevant output indicators to measures identified as being relevant to climate include:

Budget programme	Indicators
	• O1: Total public expenditure • O2: Total investment • O3: Number of actions/ operations supported • O4: Number of holdings/ beneficiaries supported • O5: Total area (ha) • O6: Physical area supported (ha) • O7: Number of contracts supported • O8: Number of livestock units supported • O9: Number of holdings participating in supported schemes • O10: Number of farmers benefiting from pay-outs • O13: Number of beneficiaries advised • O14: Number of advisors trained • O15: Population benefiting from improved services/ infrastructure Commission Implementing Regulation 834/2014 also sets out the detail of the result indicators specific to EAGF. Climate relevant indicators are as follows: Greening • Total number of farmers who have to apply at least one greening obligation • Total number of hectares declared by those farmers Greening exemptions • Number of farmers exempted by: organic farmers/exempted from crop diversification/exempted from EFA obligation • Number of hectares declared by these farmers (organic farmers/exempted from crop diversification/exempted from EFA obligation) Crop diversification • Number of farmers subject to crop diversification (with 2 crops; with 3 crops) • Number of hectares of arable land declared by farmers subject to crop diversification (with 2 crops; with 3 crops) Permanent grassland • Number of farmers with permanent grassland counting for the ratio • Number of hectares covered by permanent grassland declared by the farmers counting for the ratio • Number of farmers with permanent grassland in designated environmentally sensitive areas • Number of hectares covered by environmentally sensitive permanent grassland declared by these farmers • Number of hectares of designated environmentally sensitive permanent grassland (total) EFA • Number of farmers subject to EFA requirements • Number of hectares of arable land declared by farmers subject to EFA • Number of hectares declared by farmers as EFA, broken down by EFA type Cross compliance • Number of hectares subject to cross-compliance • Share of CAP payments subject to cross-compliance **Result indicators:**

Budget programme	Indicators
	The Commission defines result indicators in Annex IV to Implementing Regulation 808/2014. Climate relevant indicators for EAFRD are as follows: • R10: percentage of agricultural land under management contracts to improve soil management and/or prevent soil erosion (focus area 4C)EN 31.7.2014 Official Journal of the European Union L 227/57 • R11: percentage of forestry land under management contracts to improve soil management and/or prevent soil erosion (focus area 4C) • R12: percentage of irrigated land switching to more efficient irrigation systems (focus area 5A) • R13: Increase in efficiency of water use in agriculture in RDP supported projects (focus area 5A) (*) • R14: Increase in efficiency of energy use in agriculture and food-processing in RDP supported projects (focus area 5B) (*) • R15: Renewable energy produced from supported projects (focus area 5C) (*) • R16: percentage of LU (Live-stock Unit) concerned by investments in live-stock management in view of reducing GHG (Green House Gas) and/or ammonia emissions (focus area 5D) • R17: percentage of agricultural land under management contracts targeting reduction of GHG and/or ammonia emissions (focus area 5D) • R18: Reduced emissions of methane and nitrous oxide (focus area 5D) (*) • R19: Reduced ammonia emissions (focus area 5D) (*) • R20: percentage of agricultural and forest land under management contracts contributing to carbon sequestration or conservation (focus area 5E) *(*) Complementary result indicators* According to the 2017 summary of programme statements, 18 result indicators. To date, reporting against all 18 indicators is missing. The following programme level indicators have been developed: • Focus area 4C: improving soil management: a) % of agricultural land under management contracts preventing soil erosion and improving soil management; b) Percentage of forest area under management contracts preventing soil erosion and improving soil management. • Focus area 5B: increasing efficiency in energy use in agriculture and food processing: a) Total investment in energy savings and efficiency • Focus area 5C: Facilitating the supply and use of renewable sources of energy, of by products, wastes, residues and other non-food raw material for purposes of the bio-economy: a) Total investment in renewable energy production • Focus area 5D: Reducing nitrous oxide and methane emissions from agriculture: a) % of LU concerned by investments in life - stock management in view of reducing the GHG and ammonia emissions; b) % of of agricultural land under management contracts targeting reduction of GHG and ammonia emissions • Focus area 5E: Fostering carbon sequestration in agriculture and forestry: a) % of agricultural and forest area under management to foster carbon sequestration Commission Implementing Regulation 834/2014 also sets out the detail of the result indicators specific to EAGF. Climate relevant indicators are as follows: • 2.12 Share of grassland in total utilized agricultural area • 2.13 Share of ecological focus area (EFA) in agricultural land • 2.14 Share of area under greening practices • 2.15 Net greenhouse gas emission from agricultural soils **Impact indicators:** The Horizontal Directive (Article 110) mandates the establishment of a common monitoring and evaluation framework covering all areas of CAP expenditure, whether funded from the EAGF or the EAFRD. An initial report is due to be presented by the Commission in October 2018. Commission Implementing Regulation 834/2014 sets out the detail of the indicators.

<table>
<tr><th>Budget programme</th><th>Indicators</th></tr>
<tr><td></td><td>Climate relevant indicators are as follows:
1.7 Emissions from agriculture
1.10 Water abstraction in agriculture
1.12 Soil organic matter
1.13 Soil erosion by water</td></tr>
<tr><td>LIFE</td><td>Under Article 3 of the programme legislation (1293/2013), the following climate-related performance indicators are specified:
the number of interventions developed or undertaken that implement plans, programmes or strategies pursuant to Union environmental or climate policy and legislation, and the number of interventions suitable for replication or transfer
the number of interventions achieving synergies with or mainstreamed into other Union funding programmes, or integrated into public or private sector practice
the number of interventions to ensure better governance, dissemination of information and awareness of environmental and climate aspects
The development and implementation of impact and result indicators is carried out at programme level. In accordance with Article 3, the following performance indicators were developed and implemented for the climate action sub-programme established in the 2014-2017 MAWP:

<u>Mitigation</u>:

<table>
<tr><th></th><th>Quantitative outcomes</th><th>Qualitative outcomes</th></tr>
<tr><td rowspan="3">Integrated Projects</td><td>No. of projects</td><td>Increased no. of Member States/regions applying integrated approaches, with support from an IP or replicating the results from an IP.</td></tr>
<tr><td>No. and area coverage and citizens reached under climate change mitigation strategies or action plans implemented.</td><td>Increased no. of complementary measures in Integrated Projects financed by other Union Funds.</td></tr>
<tr><td>No. and volume of complementary projects funded by other Union or other funds.</td><td>Tons of GHG reduced by new technologies, systems, instruments and/or other best practice approaches developed and taken up following LIFE examples.</td></tr>
<tr><td rowspan="2">Technical assistance projects</td><td>No. of projects</td><td>Increased No. and improved quality of IP linked to technical assistance</td></tr>
<tr><td>Percentage of technical assistance projects leading to a LIFE IP</td><td></td></tr>
<tr><td>Capacity building projects</td><td>No. of projects.</td><td>Increased relative share of successful applications from Member States eligible for capacity building.</td></tr>
<tr><td rowspan="3">Other projects</td><td>No. of projects.</td><td>Increased No. innovative technologies, systems and instruments and/or other best practice solutions for the reduction of greenhouse gas emissions.</td></tr>
<tr><td>No. of funded projects promoting innovative technologies, systems and instruments and/or other best practice solutions for greenhouse gas emissions reduction.</td><td>Increased percentage of updated or new approaches developed through LIFE that have been systematically used or improved by the private and public sectors.</td></tr>
<tr><td></td><td>Tons of GHG reduced by new technologies, systems, instruments and/or other best practice approaches developed and taken up following LIFE</td></tr>
</table>
</td></tr>
</table>

Budget programme	Indicators

		examples.

Adaptation:

	Quantitative outcomes	Qualitative outcomes
Integrated Projects	No. of projects	Positive impact on climate resilience in a region and economic sectors through actions funded under LIFE and other complementary projects.
	No. and area coverage and citizens reached under adaptation strategies or action plans, or other adaptation plans with large territorial scope implemented through LIFE.	Increased No. of MS/regions applying integrated approaches with support from an Integrated Project or replicating the results from an IP.
	No. of trans-regional or cross-border adaptation projects.	Increased No. of complementary measures financed by other Union Funds.
	Number and volume of complementary projects funded by other Union or other funds.	Positive impact of LIFE projects on climate resilience of particularly vulnerable areas identified in the EU Adaptation Strategy.
Technical assistance projects	No. of projects.	Increased No. and improved quality of integrated projects linked to technical assistance.
	Percentage of technical assistance projects leading to a LIFE IP.	
Capacity building projects	No. of projects.	Increased relative share of successful applications from MS eligible for capacity building.
Other projects	No. of projects.	Attributable increase in climate resilience, broken down by sector, due to the demonstrated new technologies, systems, instruments and/or other best practice approaches developed and taken up following LIFE examples.
	No. of funded projects promoting innovative technologies, systems and instruments and/or other best practice solutions for climate resilience.	Positive impact of LIFE projects on climate resilience of particularly vulnerable areas identified for LIFE funding in the EU Adaptation Strategy.
	No. of vulnerability assessments, climate change adaptation strategies or action plan developed through LIFE.	
	No. of trans-regional or cross-border adaptation projects.	

Governance:

	Quantitative outcomes	Qualitative outcomes
Information, awareness and dissemination projects	No. of projects.	Increased awareness regarding human-caused climate change and solutions, as measured by Eurobarometer surveys.
	No. of citizens, enterprises, local authorities, registered non-governmental (NGO) and other civil society organisations reached.	Increased participation in stakeholder consultations or policy discussions related to climate policy and l5egislative

<table>
<tr><th>Budget programme</th><th>Indicators</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td></td><td>acts.</td></tr>
<tr><td></td><td>Geographic spread and area covered.</td><td></td></tr>
<tr><td>Best practice projects and other projects</td><td>No. of projects.</td><td>Increased No. of best practices taken up by households, enterprises, authorities or incorporated into national/regional programmes or action plans.</td></tr>
<tr><td></td><td>No. of attributable consolidated practices using indicators or tools developed and tested following LIFE examples.</td><td>Reduced number of infringement cases of EU legislation attributable to LIFE interventions.</td></tr>
<tr><td></td><td>No. of policy approaches or legislation proposals based on projects results.</td><td></td></tr>
</table>

Mandatory indicators for monitoring the use of FIs under LIFE are set out by FI and include:

• Under the NCFF: “Impacts on climate resilience (exposure to climate change and sensitivity to its impacts) of regions and economic sectors, in particular in vulnerable areas identified as priority for LIFE funding in the EU Adaptation Strategy as a result of the funded projects”
• Under the PF4EE: “Energy savings generated (GWh) as a result of the PF4EE loans; Reduction of CO 2 emissions (tons of CO 2) as a result of the PF4EE loans”

At project level, additional indicators have been developed, referred to as complementary indicators. Beneficiaries must report on at least one of the complementary indicators.

• Mitigation indicators include: CO2 emissions, other GHG emissions, CO capture and sequestration.
• Adaptation indicators include: adaptation area, particularly vulnerable area, and infrastructures targeted for climate resilience.
• Governance indicators include: Compliance/ enforcement, duty holders covered, supervisory/enforcement bodies involved, risk-based compliance/ enforcement system put in place/ completed, effect/ impact of involving NGOs and other stakeholders in project activities, information and awareness raising of the general public, other tools for reaching/raising awareness of the general public, and surveys carried out regarding awareness of the environmental/climate problem addressed (only mandatory for information and awareness projects)

All monitoring and reporting of LIFE indicators is captured by an electronic database with private access for the Commission (http://www.neemo.eu/about-neemo.html)</td></tr>
<tr><td>Horizon 2020</td><td>Results are only tracked in financial terms, that is the fraction of the expenditures that are spent on climate-relevant projects, using the OECD Rio-markers. Next to the tracking in financial terms, the following key performance indicators are applicable for the Societal Challenges under H2020:

<table>
<tr><td>Publications in peer-reviewed high impact journals in the area of secure, clean and efficient energy

Target: On average, 20 publications per €10 million funding (for all societal challenges)</td></tr>
<tr><td>Patent applications and patents awarded in the area of secure, clean and efficient</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Budget programme</th><th>Indicators</th></tr>
<tr><td></td><td>
<table>
<tr><td>energy

Target: On average, 2 per €10 million funding (2014 - 2020)</td></tr>
<tr><td>Publications in peer-reviewed high impact journals in the area of smart, green and integrated transport

Target: On average, 20 publications per €10 million funding (for all societal challenges)</td></tr>
<tr><td>Patent applications and patents awarded in the area of smart, green and integrated transport

Target: On average, 2 per €10 million funding (2014 - 2020)</td></tr>
<tr><td>Publications in peer-reviewed high impact journals in the area of climate action, resource efficiency and raw materials

Target: On average, 20 publications per €10 million funding (for all societal challenges)</td></tr>
<tr><td>Patent applications and patents awarded in the area of climate action, resource efficiency and raw materials

Target: On average, 2 per €10 million funding (2014 - 2020)</td></tr>
</table>

Source: https://ec.europa.eu/programmes/horizon2020/en/news/horizon-2020-indicators-assessing-results-and-impact-horizon</td></tr>
<tr><td>CEF</td><td>CEF is a support tool for projects of common interest (PCI). All PCI go through a process of assessment of market integration, security of supply, sustainability – it also needs to be in the gas or electric Ten Year Network development plan (TYNDP) – which should justify its strategic and energy benefits. No additional CO2 monitoring is carried out on top of the PCI process.

The indicators stipulated in Article 4 of the CEF regulation (1316/2013) have no common methodology for reporting. The results information should be in national TYNDP (which includes cost benefit assessments for each project), but the information is not extracted and collated at budget programme level.

Climate related indicators stipulated in Article 4 include:

Contributing to sustainable development and protection of the environment in energy:
• The amount of renewable electricity transmitted from generation to major consumption centres and storage sites;
• The amount of avoided curtailment of renewable energy;
• The number of deployed smart grid projects which benefited from the CEF and the demand response enabled by them;
• The amount of CO2 emissions prevented by the projects which benefited from the CEF.
Ensuring sustainable and efficient transport systems (proxy indicators only – not included in the main body of this report):
• the number of supply points for alternative fuels for vehicles using the TEN-T core network for road transport in the Union;
• the number of inland and maritime ports of the TEN-T core network equipped with supply points for alternative fuels in the Union</td></tr>
<tr><td>Copernicus</td><td>No climate related indicators have been identified</td></tr>
<tr><td>ENI
DCI
EDF</td><td>The methodology for results tracking is established by the EU International Cooperation and Development Results Framework (SWD(2015)80). The framework is a tool intended to measure results achieved against strategic development objectives, and to offer a complementary form of monitoring and reporting to project level reporting. It is developed for all expenditure falling under Heading 4 of the EU budget (Global Europe).</td></tr>
</table>

Budget programme	Indicators
	The framework is structured with three levels: Level 1: Looks at impacts and outcomes as a measure of development progress in partner countries over a long timeframe. The purpose of this monitoring and reporting is to set the operational context in which the results of EU external assistance should be seen. Indicators at this level at determined at international level (e.g. millennium development indicators). Level 2: Looks at development outputs and direct outcomes – linked to EU projects and programmes. Results identified at level 1 are associated to those included at level 2 – although should be treated as contextual indicators. Level 3: Looks at organisational performance (i.e. to see how DG NEAR is managing operational processes) Level 1 indicators: • Renewable energy production as a proportion of total energy production (%) [Energy 12] • Number of deaths per 100,000 population from climate-related and natural disasters (average over 10 years) [Natural Resources, Environment and Climate Change 20] • CO2 equivalent emission (kilo tonnes) [Natural Resources, Environment and Climate Change 21] • Proportion of population using an improved drinking water source) [Natural Resources, Environment and Climate Change 22] • Rate of net forest cover change, since 2000 (%) [Natural Resources, Environment and Climate Change 23] Level 2 indicators: • Number of people provided with access to sustainable energy services with EU support [Energy 11] • Renewable energy production supported by the EU [Energy 12] • Number of countries/ regions with climate change strategies either developed and/ or implemented with EU support [Natural Resources, Environment and Climate Change 23] • Number of ha of protected areas being managed [Natural Resources, Environment and Climate Change 24] • Number of MSMEs applying sustainable consumption and production practices [Natural Resources, Environment and Climate Change 25] Level 3 indicators: • Amount and share of EU-funded international cooperation and development assistance contributing to: (A) protecting biodiversity, and (B) fighting climate change (adaptation and mitigation) [Environment and climate change 12] Source: https://europa.eu/capacity4dev/eu-rfi In the ex-ante phase, DG DEVCO evaluates climate change impacts according to the data reported in the CRIS. Impacts are assessed by thematic programme for specific initiatives like GCCA+ and Energy. These impacts are later linked to the indicators of level 1. (Pers. Comm., DG DEVCO)
IPA II	Results tracking for the IPA II does not sit within the results framework established for EU external expenditure. The methodology for results tracking is established by guidelines on monitoring and evaluation for the ENI and IPA II. The guidelines are intended to provide a consistent framework for both funding programmes and build on the EU results framework which applies to the ENI but not the IPA II. As such, the performance framework established for the IPA II includes three levels of monitoring (to reflect the EU results framework – see figure below) (Commission Staff Working Document). It includes monitoring at strategic level, operational level and at the level of the intervention logic.

Budget programme	Indicators
	Climate related examples of indicators are provided in the guidelines, as follows: • Renewable energy share in the total final energy consumption (classified as an indicator to show the overall objective in terms of impact) • SMEs participation share in energy efficiency (classified as an indicator to show specific objective in terms of outcome) • Degree of progress in low emission development strategies adoption (classified as an indicator to show specific objective in terms of outcome) See Boxes 19 and 20 for full list of examples. (DG NEAR, 2016)[299]

[299] DG NEAR (2016) Guidelines on linking planning/ programming, monitoring and evaluation.

Annex 5 Appendix 3 – Review of methodologies and indicators developed internationally and nationally

To supplement the review of methodologies that have been used to monitor the results of EU programmes, we have also reviewed international examples to identify alternative options, as well as identify potential good practice cases that can be replicated.

A3-1 International Financial Institutions

The International Financial Institutions (IFI)[300] maintain a framework to ensure that GHG accounting is harmonised across the various IFIs. The framework consists of a general methodology for evaluating the GHG impacts of projects and a set of minimum requirements for company-level reporting.

It is intended to provide consistency, comparability and reliability with regards to project-level accounting. This sets a standard for other institutions that undergo project-level GHG accounting. It also facilitates third parties who use the reported data and the sharing of experience between IFIs.

The accounting methodology is based on the GHG emissions arising from a representative year of operation. The actual evaluation process should be done in accordance with established methodologies for ex-ante GHG accounting. Acceptable methodologies include the GHG Protocol[301], the CDM methodology[302], the Verified Carbon Standard[303], the EU Emissions Trading Scheme[304] and so on. The framework specifies that the project boundary should include all activities that are financed as part of the project in question. Scope 1 and 2 emissions are compulsory but Scope 3 emissions can be included at the discretion of the IFI in question.

The evaluation is intended to derive the net GHG emissions from a project for a representative year of operation. Net GHG emissions are equal to total emissions from the counterfactual less the total emissions from the project. In general, any increases or changes in activity should be compared to additional activity from new or existing sources.

While the framework advises the use of established methodologies, the IFI provide specific guidance on energy efficiency and renewable energy projects. These guidance notes advise on the use of appropriate grid emission factors, addressing changes in energy intensity versus changes in production levels

IFIs are obliged to account for GHG emissions for all direct investment projects that they finance. They are required to make a public statement of this commitment. IFIs are required to report total and net emissions for their entire portfolio on an annual basis, at the minimum; further disaggregation by sector or country is welcomed but optional.

The IFI Technical Working Group is responsible for the ongoing maintenance and development of the framework. The stated goals of the Technical Working Group and the IFIs is to establish a mechanism for data sharing and peer review and the development of an MRV procedure.

A3-2 Global Environment Facility

The Global Environment Facility (GEF) are engaged in an ongoing process of development with regards to GHG emission reduction calculations. At the present time, the GEF maintain sector-specific guidelines for projects related to transportation, energy efficiency and renewable energy. In addition, there are draft guidelines for projects relating to the urban sector, stationary biomass combustion and AFOLU.

[300] Comprising: the World Bank, the regional development banks, and the International Monetary Fund.
[301] http://www.ghgprotocol.org/calculation-tools
[302] https://cdm.unfccc.int/methodologies/index.html
[303] http://www.v-c-s.org/
[304] https://ec.europa.eu/clima/policies/ets/monitoring_en

The GEF have also stated an intention to ensure that their methodologies are aligned with those of the IFI[305]. Additionally, the World Resources Institute's GHG Protocol Policy and Action Standard (hence WRI Standard) has been incorporated into the GEFs general evaluation procedures. The WRI Standard is heavily used in the definition of project boundaries, mapping causal chains and the general principles of creating baseline and project scenarios. The WRI Standard does provide detailed guidance on methodological considerations with regards to specific sectors. As such, the GEF still recommend the use of sector-specific guidance, including the GEF's own guidance notes as mentioned above.

GEF methodologies differ from other project methodologies (such as the CDM) because they are concerned with a range of impacts outside of the immediate investment and the direct benefits to which it leads. The GEF have a longer-term approach, focusing on strategic market development. The projects are often less tangible in nature, sometimes focusing on policy development, technology transfer and capacity building. This changes the nature of the counterfactual, which is can be oriented on the state of the market in the host country rather than the direct GHG savings from the project; as such the mitigation assessments may include the impacts from replication. Finally, GEF projects also differ from many others because funding is granted before the GHG assessment, rather than as a condition of the demonstration of favourable GHG impacts. Coupled with the typical lack of data for GEF projects, this has led to the development an approach that is somewhat less data-intensive when compared to other methodologies.

As with many other systems, the GEF methodology distinguishes between consequential and direct GHG emissions reductions. Consequential emissions are defined as '*projected emissions that could result from a broader adoption of the outcomes of a GEF project plus longer-term emission reductions from behavioural change*.' [306] Direct emissions are those attributable to the physical action of the project itself.

The GEF provide a wide series of recommendations on the use of data and standards from other sources when calculating GHG emissions. These include UNFCCC tools for calculating project lifetimes, guidance for calculating appropriate grid emission factors, the IPCC guidelines for GHG inventories and recommended 'meta-datasets' for specific purposes. Sector-specific guidelines provide further recommendations and sector-appropriate interpretations of the GEF guidelines.

A3-3 International Climate Fund (ICF) Monitoring and Evaluation Framework

The International Climate Fund (ICF), which is the UK government's commitment to developing countries to assist them in addressing the challenges presented by climate change, has created a monitoring and evaluation (M&E) framework that gives guidance on methodologies for impact assessment.

The M&E framework of the ICF is led by IMC Worldwide, a consortium including the Independent Commission for Aid Impact (ICAI), and includes three methodologies[307]:

1. Developing and testing of a set of robust Key Performance Indicators (KPIs).
2. Analysing and aggregating information from varied programme level evaluation data and other forms of evidence based on the ICF's Theory of Change, also called the Macro-Evaluation.
3. Collecting and sharing of results, knowledge and lessons learned across the programmes.

The M&E framework includes 15 Key Performance Indicators (KPIs) across its three thematic areas (climate adaptation, climate mitigation and forestry in low- and middle-income countries) to assess direct impacts of the fund and assess its progress towards long-term goals. The ICF follows an iterative approach to developing these KPIs by testing them individually before introducing them at the portfolio level. Every ICF project is required to be able to report on its own, on at least one individual

[305] http://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.C.48.Inf_.09_Guideline_on_GHG_Accounting_and_Reporting_for_GEF_Projects_4.pdf
[306] http://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.C.48.Inf_.09_Guideline_on_GHG_Accounting_and_Reporting_for_GEF_Projects_4.pdf
[307] http://icai.independent.gov.uk/wp-content/uploads/ICAI-Report-International-Climate-Fund.pdf

KPI, however the 15 overall KPIs allow for aggregation of several programmes. At the moment this is applicable to 120 of the 230 programmes included in the ICF. An example for adaptation KPIs is the number of people supported by the programme. For low carbon development the data points that are used consist of the number of people who gained access to energy and the units of technologies or capacity of energy installed and for forestry it includes the number of people benefitted and the number of hectares with avoided deforestation. Lastly, the ICF has also developed cross-cutting KPIs that estimate the amount of jobs created by the programme, carbon emissions reduced and public and private finance mobilised.

For the second methodology, the ICF reviews its 15 largest programmes, covering over half of the spending of the ICF. Data points that are reviewed for each programme include the timeframe for results, objectives set out and its alignment with ICF objectives, delivery and reported and expected results. These include the emissions reduced, capacity of energy installed, energy savings made, sustainable transport taken up, number of people benefitted and an evaluation of its trajectory. During this process the theory of change design is assessed as well as its alignment with each individual programme.

Lastly, the M&E framework of ICF assess whether the ICF influences global climate finance mechanisms and its knowledge base. It tries to answer the questions whether ICF is supporting learning in priority countries and whether learning is bringing about the mainstreaming of climate change within development work. It assesses the level to which lessons are shared across government departments, the amount of learnings coming from smaller and bigger projects and it evaluates the ICF results framework and reporting system. This has shown challenges in assessing attribution, establishing baselines and targets and dealing with longer-term time horizons.

A3-4 The Scottish Government Environmentally Extended Input-Output (EIO) Model Methodology

In 2009 the Scottish government identified a methodology to assess the impact of government spending on greenhouse gas emissions, i.e. the Extended Input Output model methodology[308]. This methodology was selected as the best option for assessing emission impact after an assessment of a range of different methodologies and their qualities and limitations.

An input-output model illustrates the flows of goods and services in the economy over a period of time. This type of model can give an overview of the relationships between producers and consumers and the interdependencies of industries. It can thereby estimate the output changes that fluctuations in demand can indirectly cause. The environmentally extended input-output model uses average industry-level environmental data to assess the environmental impacts per value sold by a specific industry. This is the GHG ratio and is presented as the emissions in tonnes of carbon dioxide equivalent gases for each £1m of output. The model also includes inter-industry purchases, which can be used to indicate the carbon impacts required to meet changes in final consumption by the government. The final result of this methodology enables the Scottish government to publish estimated direct and indirect greenhouse gas emissions that result from £1 million of final demand from each industry category.

The EIO Model is made up of different tables. The supply table demonstrates the absolute monetary value of each industry's output in a year. It also shows relationships between product output and industry output. For example, it can estimate how much competition there is between industries that produce the same good or service. The use table focuses on the consumption of goods and services and the inputs that these use. Subsequently the symmetric tables use these other tables to present the interdependence of industries. It lists each industry and their effects on total output with an additional £1m of final demand.

The data that is needed for this assessment include a detailed overview of the government draft budget spending plans including details on who receives the money. Subsequently this needs to be entered into the appropriate EIO model final demand industry sectors. Additionally, industry GHG emissions data, HM Treasury deflators, a domestic input-output model and a wider (UK) closed input-output model are required for a full analysis. The model then gives estimates for domestic GHG

[308] http://www.gov.scot/Topics/Statistics/Browse/Economy/Input-Output/CarbonAssessment

estimates directly from government spending, indirectly embedded emissions in supplier industries and an estimation for imported GHG estimates. The results will be presented as GHG emissions for Scottish Government spend by portfolio.

Annex 6: Transparency and reporting

1 Introduction and objectives

1.1 Policy context

1.1.1 EU Energy and Climate commitments

The European Commission is looking at cost-efficient ways to make the European economy more climate-friendly and less energy consuming. Its low-carbon economy roadmap[309] suggests that by 2050, the EU should cut greenhouse gas emissions to 80 % below 1990 levels. Milestones to achieve this are 20 % emissions cuts by 2020[310], and 40 % by 2030[311]. Alongside these mitigation targets, the EU adaptation strategy helps to ensure that adaptation considerations are addressed in all relevant EU policies.

The delivery of the EU's climate objectives will require significant investment. At the time that the Europe 2020 Strategy was adopted, it was estimated that by 2020 public and private investment of ~€125 billion per annum would be needed to carry out climate mitigation actions across all sectors (including agriculture, buildings, energy, industry, transport, and waste). Further investment is also necessary for climate adaptation actions; and climate resilience needs to be built in to all long-term investments.

1.1.2 The Multiannual financial framework (MFF)

The multiannual financial framework (MFF) provides a framework for financial programming at the EU level. It lays down the maximum annual amounts ('ceilings') which the EU may spend in different political fields ('headings') over a period of at least 5 years. It also allows the EU to carry out common policies over a period that is long enough to make them effective. This long term vision is important for potential beneficiaries of EU funds, co-financing authorities as well as national treasuries.

With a view to responding to the challenges and investment needs related to climate action, the European Commission is implementing a mainstreaming methodology during the current (2014-2020) MFF including by aiming to make at least 20 % of EU expenditure climate related.[312] The 'reflection paper on the future of EU finances'[313] published by the European Commission in late June 2017 further emphasises this aim to streamline and simplify the EU budget system in order to facilitate more efficient spending.

1.2 Objectives of the report

The objectives of this report are to provide a review of how the current (2014-2020) MFF arrangements for mainstreaming, and for tracking climate-related expenditure and its achievements, have operated in practice; and to make recommendations for potential options for improving the current approach and processes.

1.2.1 Scope of the current report

As part of the report a review has been performed of the different approaches that have been taken to mainstream climate change issues into EU budget programmes and financial instruments, as well as the approaches to track and report climate expenditure (inputs) through budget programmes, the leverage of investment from financial instruments (outputs) as well as the overall effects of these investments on greenhouse gas emissions and climate adaption actions (results).

[309] COM(2011) 112, A roadmap for moving to a competitive low carbon economy by 2050. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0112
[310] COM (2010) 639, Energy 2020. A strategy for competitive, sustainable and secure energy. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1409650806265&uri=CELEX:52010DC0639
[311] COM(2014) 15, A policy framework for climate and energy in the period from 2020 to 2030. Available at: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52014DC0015
[312] COM(2011) 500, A budget for Europe 2020. Available at http://eur-lex.europa.eu/resource.html?uri=cellar:d0e5c248-4e35-450f-8e30-3472afbc7a7e.0011.02/DOC_4&format=PDF
[313] COM(2017) 358, Reflection paper on the future of EU finances. Available at: https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-eu-finances_en.pdf

Separate reports have been prepared for each of the different elements of the review (mainstreaming, inputs, outputs, results), along with a further report assessing the investment needs associated with the EU's climate targets.

This current report brings together the findings from the other reports in order to present an overview of the overall transparency framework. It particular it considers the over-arching systems for reporting progress on the different climate-relevant components of the budget.

1.3 Key components of a reporting framework

Prior to exploring the different elements of the reporting framework (also known as a transparency framework) of the current EU budget, it is first useful to describe in more general terms what a transparency framework might include.

In the most simple terms, a reporting framework would include the following components:

- **Who** – who is responsible for the different aspects of the reporting.
- **What** – what is the information that needs to be reported, including the format of the reported information.
- **When** – what are the timelines for reporting.
- **How** – what are the reporting tools/mechanisms that are used.

Overlaid on this framework should also be all legal, procedural, and institutional elements. This would include the necessary regulations that might be used to ensure implementation of the framework. It would also include any relevant guidelines describing the relevant process and approaches that need to be followed.

1.3.1 Level of application

A reporting framework can be developed and applied at different levels. It can be developed at an individual project level, at the level of the programme that supports the individual projects, or at a more aggregated level (for example at a budget level capturing multiple programmes). The level at which the framework is developed will ultimately depend upon what the aims of the framework are. If the primary aim is to report progress on the implementation of individual actions, then a project level framework might be most appropriate. In contrast, if the aim of the framework is to report progress across a range of programmes, then a more aggregated framework tracking framework might be more appropriate.

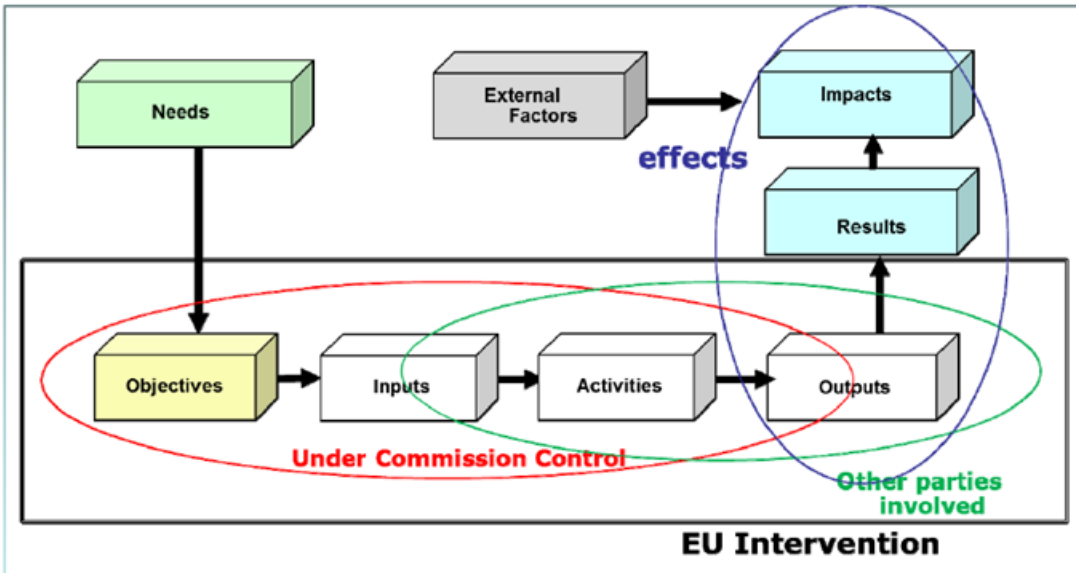
In practice, reporting frameworks are frequently developed at multiple levels of application in parallel, so frameworks may be developed for reporting at the individual project level, but separately also at the programme and budget level. In this way the results reported at project level can potentially be aggregated together to estimate the impacts of the associated programmes, and likewise the impacts from the individual programme can potentially be aggregated together to estimates the impacts of the overall budget. However, challenges can arise where the reporting frameworks at project and/or programme level are not consistent, for example the timing of reporting might vary or the format of the data reported, so the results cannot be easily aggregated together.

Since this report is concerned primarily with the transparency framework for the EU budget as a whole, the challenges associated with the aggregation of information from individual budget programmes and financial instruments is of particular relevance. These issues are discussed further in subsequent sections of the report.

1.3.2 Tracking the different stages in the intervention logic

A further consideration for the tracking framework is at what stages in the implementation of a programmes should the tracking be performed, and indicators reported. This can be described in relation to the intervention logic.

The intervention logic for a programme describes the causality for programme – showing how an intervention was triggered by a certain set of needs or problems occurring within a certain context and how it was designed, with the intention of producing the desired changes. This includes a description of the inputs, activities and outputs, along with the expected results and impacts. Indicators may be defined for the programme for different parts in the intervention logic, in order to monitor performance of the different stages. This is shown in the diagram below.



Source: Better Regulation Guidelines. SWD(2015) 110 final

The tracking framework could potentially capture each of the different stages in the intervention logic, from the inputs through to results. The benefit of including each of these different stages is that the framework would provide an important understanding of how well the inputs (i.e. expenditure) were being translated into outputs or results. This information can therefore be use to track progress, to inform future evaluations of performance, and help with the prioritization of resources.

This approach is also consistent with the analysis which has been performed in the current study, whereby the review has explored separately the systems and frameworks for tracking climate-relevant expenditure (inputs), the leverage of additional funding in climate relevant projects (outputs) and the impact on greenhouse gas emissions and climate change adaptation (results) associated with the investments.

2 Methodology

The methodology that was followed in the implementation of the study is described below. A similar approach was followed for each of the different stages in climate tracking framework: inputs, outputs and results.

2.1 Selection of the budget programmes and financial instruments

An initial step in the analysis involved the selection of the specific budget programmes and financial instruments to be analysed in more detail.

While mainstreaming climate change considerations is important for all areas of the budget, in practice the potential for different areas of expenditure to deliver greenhouse gas (GHG) savings, or increase climate resilience, will vary considerably between the different budget programmes and financial instruments. It was therefore agreed that the review should focus on those areas of the budget that are expected to have the most significant climate-related impacts, since this is where the need for robust approaches to climate tracking are most important.

The budget programmes were selected on the basis of their relative contribution towards the total climate-related expenditure, as reported in the Staff Working Document accompanying the Mid-term Review of the MFF (SWD(2016)299)[314]. More specifically, all budget programmes with an expected climate-related expenditure of >1 000 million Euro, over the 2014-2020 programming period, were included in the in-depth analysis (see annex 3). These cover 99.6 % of the total EU budget for 2014-2020.

The financial instruments (FIs) were also selected based on relative volume of funding, although this was based on total EU contribution to the FIs in question due to a lack of data on climate-relevant funding. The selection was then refined based on a qualitative assessment of the climate relevance of the FIs e.g. if the instruments has an explicit objective to address climate change, and/or are targeted on a sector that is clearly climate relevant. Finally, the selection was refined to ensure that it captured a representative sample of the different instrument types / designs that the EU budget supports, as well as to include selected instruments with strong climate relevance but which did not meet the investment volume threshold (see annex 4).

2.1.1 Data collection

The data collection process aimed to capture the following information:

- Specific monitoring and reporting requirements and procedures for climate-relevant elements of the EU budget
- Performance indicators and other metrics used in the monitoring and reporting of climate-relevant elements of the budget
- Methodological frameworks used in the assessment of performance of climate-relevant elements of the budget
- Guidance for the development and implementation of indicators and monitoring frameworks

2.1.2 Data analysis

The information gathered for each of the individual budget programmes and FIs was synthesised and further analysed in order to identify potential gaps and inconsistency in the current approaches to tracking, but also particular strengths (e.g. best practice), and areas requiring further strengthening.

[314] Commission Staff Working Document *Accompanying the document* Communication from the Commission to the European Parliament and the Council – Mid-term review/ revision of the multiannual financial framework 2014-2020. An EU budget focussed on results. SWD(2016)299. Brussels, 14.9.2016.

3 Analysis

3.1 Introduction

Drawing upon the results from the analysis of existing approaches to tracking climate mainstreaming, inputs (expenditure), output and results, a synthesis is provided of the current reporting system across the EU budget as a whole, and the problems with the current approach. Options are then identified and evaluated for addressing the identified problems, and for improving reporting on overall contribution of the budget to climate objectives.

The analysis in this report is focussed on the current approaches to the reporting of information. Clearly this is closely related to the approaches that are used to identify, develop and calculate the indicators that are reported. Further information on these aspects of the transparency framework are presented in the other annex reports.

3.2 Current reporting requirements

The current reporting requirements for the climate-related elements of the selected budget programmes, and financial instruments are summarised in Table 3.1 below. A brief description is provided for each of the reporting mechanisms, along with details on the frequency of reporting, the format of the reporting, the entities responsible for reporting and the level at which the reporting is made (i.e. project, programme, or budget level). The type of climate relevant information is also indicated, as either input data (i.e. expenditure), outputs data (i.e. leverage by FIs) or results data.

An initial observation from the mapping is that there are already a large number of different reports, tools and datasets which cover the selected budget programmes and FIs. That is not to say that there are no areas of improvement, but there are some strong foundations – at least for some budget programmes – that can be built upon.

3.1.1 Overall reporting of budget programme or FI performance

In relation to climate inputs the draft general budget and associated working documents provides a single source where information is available on the climate-related expenditure of each of the budget programmes in a consistent format. However, the report only provides the results from applying the EU's tracking approach, and not the detailed assumptions that have been applied. The transparency of the reporting could be enhanced if further information was reported on how the climate tracking approach has been applied. This could be a new report, or an annex to the existing reporting.

With respect to the reporting of information on FIs, then for centrally managed funds, the Commission's report on financial instruments supported by the general budget according to Art.140.8, provides a consistent and comparable source of information on financial performance. However, this report lacks any information which enables a mapping of the FIs to different areas of climate expenditure, and therefore the overall contribution of the FIs to the EU's climate objectives. Some of this information will be capture at budget programme level in the draft general budget submission, but this is not the case for all centrally managed FIs, and even where it is included, the relative share of the FIs in the total investment is not clear.

For FIs under shared management, the instruments under the European Structural and Investment Funds (ESIF) are also reported annually in accordance with Article 46 of Regulation (EU) No 1303/2013. This report has certain elements of best practice from a transparency perspective, as it clearly describes the process that are used to collected the data, the quality check the data and to further process the data. However, as with the Art 140.8 report, this also lack information on the climate-related expenditure and associated outputs.

As described in Annex 4, for other FIs not captured in either of the above reports, the reporting of performance information is even more disparate, with different requirements applying to different individual FIs. It has not been possible to explore each of these individually.

Reporting of information on climate related results follows a similar trend as for inputs and outputs (as would be expected as the requirements are covered by the same or related regulations), but is arguably more fragmented. This is because the indicators, methodologies and tools used to assess the climate relevant impacts are more diverse, and less consistent (See Annex 5), than for inputs, or

outputs. There is some harmonisation of reporting under the common reporting framework, but this is only for related programmes and not the budget as a whole.

3.1.2 Frequency of reporting

The frequency of reporting varies according to the particular budget programmes. However, most budget programmes adopt annual reporting for at least some of the climate-relevant elements. For example, all budget programmes report the contribution of the budget towards mainstreaming of climate action as part of the Annual Programme Statements of operational expenditure. Likewise, the Annual Activity Report of the different DGs of the European Commission include progress updates against relevant policy objectives, with associated indicators.

For the ESIF budget programmes (ERDF, CF, EAFRD, EMFF) and for EAGF, there is annual reporting of performance indicators. An Annual Monitoring Report is produced for Horizon 2020 which includes progress against the climate expenditure target, and for the LIFE programme a report is produced annually on the projects that have supported under the climate action sub-programme.

For other element of climate reporting information is made available less frequently, with more detailed information only gathered as part of mid-term or final programmes reviews or evaluations. For example, more detailed information on the results from the LIFE programme were made available as part of its mid-term evaluation, and information on energy efficiency and system integration project supported under H2020 as part of a review of the first results under the programme. Planned evaluations for Copernicus and ENI may also lead to additional climate relevant information reported for these programmes.

3.1.3 Format of reporting

Reporting frequently takes two forms: a) a written report with summary tables and charts synthesising the key results, or b) a database or IT tools with specific characteristics on individual projects, and the ability to manipulate data. Both of these approaches have their merits. The former generally aim to provide a high level summary of the headline results, where relevant analysis has been performed by the report's author of the underlying data, and the finding are presented in a digestible format. The latter makes the underlying data (or part of it) available at a more granular level, and allows the user to further interrogate the information and develop their own findings.

To support the reporting different templates or tools have been developed. These templates can aid the comparability of climate-relevant information that is available; in the case of the Programme Statements of operational expenditure the same table is used to report climate related expenditure for each budget programme. For the reporting of project and programme data, including performance indicators, different tools (including IT platforms) have been developed. These platforms allow certain climate-relevant performance indicators to be extracted and further analysed (see Annex 5). However, while the structure of these datasets is consistent for the project/programmes within the scope of the tools, it is not necessarily consistent across all of the budget programmes. Moreover, there is no single data set which brings together the results over the different budget programmes and FIs, which means that individual datasets need to be analysed separately and then aggregated together to get a more complete picture at EU budget level.

3.1.4 Cross-cutting issues

The analysis presented so far has focussed on the individual requirements associated with the reporting of climate-relevant inputs, outputs and results. However, it is arguable that reporting should focus on all aspects of the intervention logic simultaneously. Put another way, it is valuable to understand for any given budget programmes, what the climate relevant expenditure has been (or is planned), what proportion of this related to FIs, what the expected leverage is from these FIs, and what the expected climate relevant results are from the expenditure to data (or future planned expenditure). None of the current reporting requirements fulfil this need, although the reporting under ERDF and CF comes closest. It is possible by drawing together evidence from different reports to piece together a picture for certain programmes, but this is not captured and reported in one place.

Table 3-1 Summary of reporting mechanisms for selected budget programmes and financial instruments

Budget programmes and FIs	Level of reporting	Reporting mechanism/output	Reporting entity (who)	Description (what)	Reporting scope (what)			Frequency (when)	Format (how)
					Inputs	Outputs	Results		
All programmes	Project	EU Budget for Results[315]	Unclear (website is managed by DG Budget, with contributions from other Commission departments).	A database summarising information on selected projects. Number of projects is limited (currently only 190 projects in total, with a much smaller number climate relevant). Limited information on climate relevant elements, other than qualitative information.			Partial	Unclear how often updated	Website
All programmes	Programme	Draft general budget of European Commission and associated working documents Working document Part I – Programme Statements of operational expenditure	European Commission	Performance information for all budget programmes. Information is reported by budget programmes in the "Programme Statements of operational expenditure" that accompany the draft budget. Section 3 of the programme statements specify the contribution of the programme towards mainstreaming of climate action	Yes			Annual	Report with summary tables
	Budget			The working document also summarises the climate-related expenditure for the EU budget as a whole.	Yes			Annual	Report with summary tables
Centrally managed FIs	FI	Financial instruments supported by the general budget	European Commission	Includes all centrally managed financial instruments for internal and external EU policies supported by the		Yes		Annual	Report with summary tables

[315] http://ec.europa.eu/budget/euprojects/search-projects_en

Budget programmes and FIs	Level of reporting	Reporting mechanism/output	Reporting entity (who)	Description (what)	Reporting scope (what)			Frequency (when)	Format (how)
					Inputs	Outputs	Results		
		according to Art.140.8[316]		Union budget Information is reported by financial instruments, as well as a summary across all FIs. No comparable information on climate is provided. Part VI provides information on the individual FIs, including on the performance data.					
All programmes	Budget	Annual management and Performance report of the EU Budget	European Commission	Performance information on performance indicators which track the longer-term and indirect impacts of EU action The indicators are high-level and relate to overall policy objectives rather than monitoring the impacts from specific areas of expenditure One indicator relates to progress against the climate mainstreaming target	Yes		Yes (but in relation to policy objecti ves)	Annual	Report with indicator data
	Programme	Annual Activity Reports	European Commission (individual DGs)	These report details achievements, initiatives taken and the financial and human resources spent during the year. Progress is reported in key policy targets and key performance indicators (KPIs). These include different indicators for different DGs. For example, for DG CLIMA this includes a KPI on climate	Yes		Yes (but in relation to policy objecti ves)	Annual	Report with indicator data

[316] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2016:675:FIN

Budget programmes and FIs	Level of reporting	Reporting mechanism/output	Reporting entity (who)	Description (what)	Reporting scope (what)			Frequency (when)	Format (how)
					Inputs	Outputs	Results		
				mainstreaming, amongst others					
ERDF, CF, ESF, EMFF	Programmes	ESI Funds Open Data Platform	Member States (national and regional authorities)	The platform includes data from the 533 national, regional or interregional programmes adopted under the ESI Funds The platform reports project data on financing and achievements under the ESI Funds 2014-2020. The indicator data is aggregated at Member State and EU level. The reported data is consistent with programme-level data in the 2016 AIRs. The platform also includes financial data on climate related expenditure	Yes	Yes (for common indication)		Annual	IT platform
	Programmes	Annual Implementation Reports (AIRs)	Member States	Member States have to submit on the implementation of the ESI Funds	Yes	Yes	Yes	Annual	Report
	Programmes	Summary report of the programme annual implementation reports	European Commission	Annual report to the EU institutions on the implementation of the ESI Funds Summarises information on project indicator achievements across all programmes and Member States Presents investment data by thematic objective, but not using the Rio markers approach, although a detailed breakdown of climate related expenditure is promised for the 2017 report	Partial	Yes	Yes	Annual	Report
	FIs	Financial instruments	Managing	The report summarises the progress		Yes		Annual, with	For ERDF

Budget programmes and FIs	Level of reporting	Reporting mechanism/output	Reporting entity (who)	Description (what)	Reporting scope (what)			Frequency (when)	Format (how)
					Inputs	Outputs	Results		
		under the European Structural and Investment Funds: Summarises of the data on the progress made in financing and implementing the financial instruments in accordance with Article 46 of the Regulation (EU) No 1303/2013[317]	Authorities	that has been made setting up FIs under ESIF Information is reported on the total amounts committed in funding agreements and paid in FIs, for the different funding programmes. Information is also required to be reported (in 2017 and 2019) on progress in achieving the leverage effect and on achievement of other performance indicators. To better demonstrate how FIs contribute to the achievement of the policy and programme and its priority objectives the reporting model also includes fields requesting information on the thematic objectives. The report also (very usefully) provides information on the quantity and quality of data provided as well as the approach to processing information.				additional information in 2017, 2019, and on completion.	and CF data were submitted based on the reporting template prepared by the Commission and submitted through the SFC201411 reporting module as part of the annual implementation reports.
EAFRD, EAGF		Annual implementation reports (AIRs)	Managing Authorities	From 30 June 2016 onwards, Managing authorities are required to submit annual implementation reports (AIRs) to the Commission Member States are required to include information on the use of FIs under EAFRD in their annual reporting on	Yes	Yes[318]	Yes[319]	Annual	Reporting for 2014-2020 has not been incorporated within the System for Fund

[317] http://ec.europa.eu/regional_policy/sources/thefunds/fin_inst/pdf/summary_data_fi_1420_2015.pdf
[318] progress in achieving the expected leverage effect of investments made by the financial instrument and value of investments and participations
[319] contribution of the financial instrument to the achievement of the indicators of the priority or measure concerned

Budget programmes and FIs	Level of reporting	Reporting mechanism/output	Reporting entity (who)	Description (what)	Reporting scope (what)			Frequency (when)	Format (how)
					Inputs	Outputs	Results		
				implementation of RDPs to the Commission					Management portal, rather Member States are asked to submit reporting using an Excel template
		Summary report of the programme annual implementation reports	European Commission	Annual report to the EU institutions on the implementation of the ESI Funds Summarises information on project indicator achievements across all programmes and Member States				Annual	
LIFE	Programme	LIFE Climate Action projects (report of projects supported in a year)	European Commission	Summary report on the project that have been supported under the Climate Action sub-programme in a given year Information of financial support to specific projects is reported, but not in the context of the Rio markers approach	Yes			Annual	Report with specific project-level data.
	Programme	Mid-term evaluation of the LIFE Programme	European Commission	Article 27 of the LIFE Regulation requires an external and independent mid-term evaluation report to be completed by June 2017	Yes		Yes	Mid-term	Report
	Project	Project level reporting against indicators	Project beneficiaries	All monitoring and reporting of LIFE indicators is captured by an electronic database with private access for the Commission			Yes	Unclear	Database

Budget programmes and FIs	Level of reporting	Reporting mechanism/output	Reporting entity (who)	Description (what)	Reporting scope (what)			Frequency (when)	Format (how)
					Inputs	Outputs	Results		
Horizon 2020	Project	Periodic report	Project beneficiaries	Projects have to provide a technical and financial periodic report for each funding period			Yes		Report
	Project	Final report	Project beneficiaries	Projects have to present their technical and financial results at the end of the project in a final report			Yes	On project completion	Report
	Project	CORDA database and project documents	Project beneficiaries	Captures project level data.			Yes	Unclear	Database
	Programme	Horizon 2020 Monitoring Report	European Commission	The Annual Monitoring Report looks at what has happened in the implementation of Horizon 2020 and its Specific Programme. The first Annual Monitoring Report focused on the implementation of the Work Programme 2014-2015, which was adopted in December 2013. Performance against the indicator on climate related expenditure is reported.	Yes		Yes	Annual	Report
	Sub-programme	Report on the first results of H2020 projects on energy efficiency and system integration	European Commission (consultant report)	Evaluation of the outcomes and impacts of the projects funded under the 'Secure, Clean and Efficient Energy' theme			Yes	Mid term	Report
CEF	Programme	Mid-term evaluation of the CEF Programme	European Commission	Article 27 of the CEF Regulation requires a mid-term evaluation report to be completed by 31 December 2017	Yes		Yes	Mid-term	Report
	Project	Action Status Report	Beneficiaries	An annual report submitted by the implementing body on the technical progress of the project against the initial plan, and the associated budget	Yes		Yes	Annual	Report

Budget programmes and FIs	Level of reporting	Reporting mechanism/output	Reporting entity (who)	Description (what)	Reporting scope (what)			Frequency (when)	Format (how)
					Inputs	Outputs	Results		
				consumption. It is the main document used by the INEA to assess progress.					
Copernicus	Programme & budget line	Annex to the Commission Implementing Decision on the adoption of the 2016 Copernicus Work Programme	European Commission	Planned expenditure to different budget lines under the work programme	Yes			Annual	Report
	Programme	Mid-term evaluation of Copernicus programme	European Commission	A mid-term evaluation (MTE) of the Copernicus programme is underway (first draft due September 2017)[320].			Yes	Mid term	Report
DCI, ENI, IPA II	Programme	DG International Cooperation and Development's 2016 Annual Management Plan and Annual Activity Report	European Commission	Results reporting on the basis of the EU RF is to be part of the "Annual Report on the European Union's development and external assistance policies and their implementation".				Annual	Report
ENI	Programme	Evaluation of ENI	European Commission	An evaluation of the ENI (2014-2020) has been undertaken			Yes	Mid term	Report
		Mid-term review of the ENI	European Commission	Separate review of the ENI				Mid term	
NCFF	FI	Annual operational report	EIB	According to the NCFF Delegation Agreement with the EIB, the Bank shall provide DG CLIMA with an annual operational report with information as at 31 December of the preceding year Information is also reported in the		Yes		Annual	Report

[320] In parallel, there is a full socio-economic and environmental assessment with modelled results to capture the quantified impacts of the programme in relation to GHG emissions savings. The approach taken will consider impacts downstream from concrete climate actions taken as a result of the Copernicus Climate Change Service.

Budget programmes and FIs	Level of reporting	Reporting mechanism/output	Reporting entity (who)	Description (what)	Reporting scope (what)			Frequency (when)	Format (how)
					Inputs	Outputs	Results		
				140.8 report (see above)					
PF4EE	FI	Annual operational report	EIB	According to the PF4EE Delegation Agreement with the EIB (see Annex 5) and the latest PF4EE operational report (covering 2016), the Bank shall provide DG CLIMA with an annual operational report with information as at 31 December of the preceding year Information is also reported in the 140.8 report (see above)		Yes		Annual	Report
	FI	Final implementation report	EIB	The EIB shall submit to DG CLIMA, no later than 6 months after the termination of the Delegation Agreement, a final implementation report on the PF4EE Instrument. The final implementation report shall cover the whole period of implementation of the PF4EE Instrument. Information is also reported in the 140.8 report (see above)		Yes		End of agreement	Report

4 Options for improving the tracking and reporting framework for the climate-relevant elements of the EU budget

Drawing upon the analysis from the previous sections, we have developed potential options for improving the tracking and reporting framework for different EU budget programmes and FIs based on the problems identified. These problems, and the associated options, are necessarily similar to those identified in relation to the climate relevant inputs, outputs and results described in the other annex reports.

We have taken a simplified approach of the steps set out in the European Commission Better Regulation Guideline to provide a framework for identifying and then appraising the options – as follows:

1. **Problem definition**: Further consideration of the problems identified in the results analysis to verify the problem, determine its impacts in terms of scope and scale, identify drivers of the problem and establish a no-change scenario.
2. **Identification of options**: In response to the problems defined, a range of options are identified for improving in the current approach. These range from major changes (e.g. changes to legislation) to more minor alterations (such as developing a platform for signposting to existing guidance documents). The development of the options has drawn upon the examples of good practice and lessons learned – as identified through the earlier results analysis. In some cases the options proposed are a variation of one of the examples of good practice.
3. **Assess the options proposed**: The purpose of this assessment is identify the most viable policy option for improving the tracking of expected climate results and impacts of the different EU funding programmes. The criteria to assess the policy options considers effectiveness (in addressing the problem areas), efficiency, coherence and feasibility (legal, political and technical).
4. **Outline the most viable package**: this final step brings together the individual options into a package of revisions that most effectively and efficiently address the problem areas.

4.1 Problem definition

In the previous section a number of issues were identified which, acting together, led to problems with **inconsistencies** in the information that is available on the climate-related elements of different programme areas and financial instruments, limited the **transparency** of information reported on the climate-related results of the EU Budget.

The following specific problems areas were identified as part of the review:

- Inconsistencies between budget programmes and FIs in the information that is reported on the climate related inputs, outputs and results, and the associated reporting tools.
- Lack of transparency in the methodologies that have been applied to e.g. track climate expenditure, or in the data aggregation processes. There is also limited detail accompanying some indicators results (e.g. baseline year, unit reported, emission factor used, etc.).
- Lack of overall framework to bring together the overall climate related input, output and results data at programme and EU budget level.

4.2 Identification of improvement options

For each of the broad problem areas described above, a number of potential improvement options have been identified. In the subsequent sections for each of the options we have assessed the relative effectiveness of the options in delivering the objectives and the efficiency (i.e. administrative burden) of doing so.

4.2.1 Inconsistencies between budget programmes on the information that is reported and the reporting format

The options for improvement in relation to this problem area might include:

- Full harmonisation of the information reported and associated tools. Building on the reporting required under the draft budget/programme statements, this would involve the full harmonisation of reporting of information on inputs, outputs and results across all budget programmes, and the inclusion of information for FIs. It would also involve the harmonisation of the IT reporting tools across programmes i.e. a central tool across all budget programmes for climate relevant information
- Full harmonisation of the information reported and partial harmonisation of the associated tools. This would also require the harmonised reporting of more complete information on inputs/outputs/results across programme budgets, but would not require the harmonisation of project level data in a single IT tool. Instead, there would be a requirement to compile certain aggregated data in separate tools
- Full harmonisation of the information reported, but no harmonisation of the associated tools. The would be as the option above, but in this case no attempts would be made to draw together the data into a central repository – only the summary data would be reported.

Full harmonisation would be most effective, but is unlikely to be feasible – particularly in relation to the IT elements. The preferred approach would therefore the full harmonisation of reporting requirements, but not harmonisation of the tools.

4.2.2 Lack of transparency in the methodologies applied

The options for improvement in relation to this problem area might include:

- Introduce a requirement, as part of the individual budget programme regulations, for each programme (above a certain significance threshold) to prepare a detailed report on the climate relevant actions and associated methodologies. The reports would be required to follow a specific template, which would include information on the methodologies that have been applied in the e.g. calculation of the climate relevant expenditure, aggregation of impacts data. The reports would be required on a biennial basis.
- Introduce a requirement, as part of the individual budget programme regulations, for each programme (above a certain significance threshold) to prepare a report on the climate relevant actions and associated methodologies. The reports would be similar to the option above, but would be more limited in scope (i.e. not as much detail) or less frequent (e.g. every 4 years).
- Introduce a new climate reporting regulation. This would require the same information to be reported as in either of the option above, but the legal basis would be a new climate reporting regulation, rather than requirements in individual regulations. This would also apply to relevant FIs. It could also specify certain methodologies (see Annex 5).
- Introduce a voluntary template for reporting, but do not make a legal requirement

There is no clearly preferred option. Making detailed reporting a legal requirement would be most effective, but also most burdensome, and this would also make it less feasible. However, in practice most budget programmes with climate relevant elements already capture information e.g. on the approach to tracking, so this would just formalise what is already done.

4.2.3 Lack of overall framework to bring together the overall climate related input, output and results data at programme and EU budget level.

The options for improvement in relation to this problem area might include:

- Further expand existing reporting mechanisms to capture climate relevant elements. This would build upon the existing reporting mechanism e.g. draft budget/programme statements, Article 140.8 report, or the Annual Activity Report and Annual management and Performance report of the EU Budget, to introduce further requirements to report additional information on the climate related elements of the programmes and FIs. There would also be a need to

streamline reporting with other energy and climate reporting requirements, including Member States' Energy and Climate plans – which may include data on planned investments.

- Introduce the requirement for the Commission to prepare a regular report on the climate relevant impacts of the overall budget. This would be a new requirement, and new output, which would focus just on the climate relevant elements of the budget. This would require the Commission to prepare a report every other year, summarising the progress that the budget has made delivering the EU's overall climate objectives. This report would bring together performance information across the whole logic chain, from inputs, outputs and results. It would encompass all those EU budget programmes reporting climate related expenditure, and would also include the relevant FIs. For each budget programmes/FIs, the report would track the flow of climate related expenditure, and the outputs and results associated with the expenditure. The report would first be expressed at programme level, but then for the budget as a whole. This could potentially be prepared alongside the Annual management and performance report of the EU budget.

There is no clearly preferred option. The requirement for the Commission to report separately on climate relevant elements of the budget might though ensure that sufficient attention is given to the activity and ensure that all relevant information is available in one place.

HOW TO OBTAIN EU PUBLICATIONS

Free publications:

- one copy:
  via EU Bookshop (http://bookshop.europa.eu);
- more than one copy or posters/maps:
  from the European Union's representations (http://ec.europa.eu/represent_en.htm);
  from the delegations in non-EU countries
  (http://eeas.europa.eu/delegations/index_en.htm);
  by contacting the Europe Direct service (http://europa.eu/europedirect/index_en.htm)
  or calling 00 800 6 7 8 9 10 11 (freephone number from anywhere in the EU) (*).

  (*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Priced publications:

- via EU Bookshop (http://bookshop.europa.eu).

Priced subscriptions:

- via one of the sales agents of the Publications Office of the European Union
  (http://publications.europa.eu/others/agents/index_en.htm).

Publications Office